CUR 'ISS HAWKS by WYLAM ■ A Flying Ornithopter ■ U-Control RE-8

MODEL AIRPLANE NEWS

JULY 1955—35 CENTS

PERFECT MODELLING AT YOUR FINGER TIPS...

Aero Gloss PLASTIC BALSA

HOT FUEL PROOF

LIGHT • STRONG • FAST-DRYING

Feels, looks, sands—just like natural balsa.
Stays plastic in the tube—does not dry out.

Here's the perfect, easily workable plastic material for forming those smooth air-flow contours and fillets with your finger tips! Never before anything like it for modelling complete units and realistic "pilots". And — built right in — is the famous Aero Gloss Hot Fuel Proofing that makes it ideal for use around engine mounts, fire-walls — anywhere that fuel may spray . . .

1½ oz. TUBE 30¢

Also in Cans at **60¢**

Aero Gloss HOT FUEL PROOF DOPE

NOW IN GOLD! Mirroring the perfection of "appearance award" winners in every contest every year, the rich, high-gloss finish of Aero Gloss is applied in a smooth-flowing, one-coat coverage to your plane, boat or car! Now in gleaming metallic GOLD in the full 1 ounce jar — plenty for small planes or trim . . . **20¢** 4 oz. jar **60¢**

AT YOUR FAVORITE MODEL STORE

pactra CHEMICAL COMPANY
1213 N. Highland Avenue, Los Angeles 38, California

LOOK FOR
THIS NEW

francisco
CONTAINER CAP

Identifying Our
New Improved Fuels...

VALUABLE FOR PREMIUMS!

All of our new, "stepped" up fuels are now packaged in containers having these new, two color caps.
The same price will prevail in all territories. Some of the improvements are: NITRO and HI-THRUST have been increased 6% to 8% in power. TOPSOL (formerly 1954 HI-THRUST) now sells for only 85¢ per pt.—$1.50 per qt., everywhere.
BLUE BLAZER (formerly 1953 HI-THRUST) is 75¢ per pt., everywhere. Try them out and see how much our exclusive 4-Way processing means to satisfaction and success.

SINCE THE DAYS OF
BARNEY OLDFIELD AND GAR WOOD...

our insignia shirts have been worn and respected by winners. Here is how to obtain them at a give-away price.

$1.85 Checkered Flag Pennant, or Scotch Light Bumper Sign .....2 caps and 35¢
$2.50 Champion T Shirt .....2 caps and 75¢
$3.50 Champion No. 1 Sport Shirt .....5 caps and $1.50
$7.50 Champion No. 2 Gabardine Sport Shirt .....5 caps and $3.00

FREE shirts to qualified Record Holders and National Champions.

Items listed above are subject to change without notice, and redemption is subject to state laws governing premium deals.

FRANCISCO LABORATORIES

Producers of the World's Most Respected Racing Fuels: BLUE BLAZER, POWER MIST, HI-THRUST, TOPSOL

3015 Glendale Blvd., Los Angeles 39, Calif.

27th Year of Publication

MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

JULY 1955 Vol. LIII—No. 1

CONTENTS

CONSTRUCTION

Boomer 9
The RE-8 14
Flapping Wings 16
Barnstormer Bipe 24

ARTICLES

The Canned Duct 12
Sandpaper 18
Man to Beat! 26
Import Review 27
Plans for Scale 30

FEATURES

MAN at Work 2
Flash News 7
Radio Control News 20
Curtiss Hawks: II 22
Engine Review 32
Foreign Notes 34
Contest Calendar 44

WILLIAM WINTER, Editor
WITTICH HOLLOWAY, Art Director

Contributing Editors: Peter Chinn (England), Don Grout, Ed Lorenz, Ted Martin, Bruce Wennerstrom, Harry Williamson

Executive and Editorial Office: 551 Fifth Avenue, New York 17, N. Y.

Advertising Manager, N. E. Slane, 551 5th Ave., New York 17; West Coast Adv. Mgr., Justin Hannon, 4068 Cranshaw Blvd., Los Angeles 43, Calif.

Editorial and Business offices: 551 Fifth Ave., New York 17, N. Y. Published monthly by Air Age, Inc., 1140 East West Highway, Silver Spring, Maryland. Jay P. Cleveland, President and Treasurer; Y. P. Johnson, Vice Pres.; G. E. Johnson, Sec. Entered as second class matter Feb. 1951 at the post office at Silver Spring, Md., under the act of March 3, 1879. Additional entry at New York, N. Y.

Price 35c per copy in U. S. Subscription Prices—U. S. and possessions: 1 yr. $3.50; 2 yrs. $5.50; 3 yrs. $7.50; Canada: 1 yr. $4.00; All other countries: 1 yr. $5.00. Payment from all countries except Canada must be in U. S. funds. Change of Address—Send to MODEL AIRPLANE NEWS, Subscription Department, 551 Fifth Avenue, New York 17, New York, at least one month before the date of the issue with which it is to take effect. Send old address with the new, enclosing if possible your address label or copy. The Post Office will not forward copies unless you provide extra postage. Duplicate issues cannot be sent.

Printed in U.S.A.

Copyright 1955 by Air Age, Inc.

by William Winter

"Many people seem worried about the effects of pre-fabricated and plastic models upon the number of new, serious modelers entering the hobby each year," remarks William Rassbach, a Pittsburgh Boys' Club instructor, whose success with old fashioned modeling among the small fry effectively proves traditional methods still work as well as they ever did, if given the chance. What had been an indifferent class produced, in a single season, 20 lads, 11 to 15 years of age, who could give the instructor a run for his money. In less than six months, these kids had progressed to free flight gas without seeing a die-cut sheet. But let Rassbach tell you.

"My boys were being given plastic models and pre-fabricated 10¢ jobs," he continues. "Few of the boys had sustained interest in modeling at this level, and almost none of them stayed around building 10¢ planes." Now, here we have to make clear that no criticism of plastic models is intended. It's the lack of a follow-through that is more to blame. Follow-through? This is the day of the pretty box and the quick turnover—why think of the future? You want pretty boxes, so naturally you get them. Personally, we'd like a nasty old plain box and printed sheets at half the price! So don't get mad at the plastic people. Ponder instead why so little is done to capitalize upon the initial contact made by plastics to produce real modelers. It was said, after the war, that so-so dealers (volume-wise) were too model plane conscious. Presumably that has been corrected. So this is good? Heh, Rassbach, where'd you go?

So Rassbach began by picking out the lads who could make a given kit, then gave them a project just hard enough to be interesting and instructive, yet not too hard. The finished models—he is hazy here, but we figure it this way—were turned over to the others in the group to get them started and then a second project was given to all members in the group. "Not only is a good deal of friendly competition set up," says Rassbach, "but the teacher's job becomes easier, for the 'second planers' are now told to help the beginners (although kids on their third and fourth plane are better able to pick the right thing to do)."

In the beginning, Rassbach found, an 11-year-old boy's interest span was 30 minutes. With time and attention—instruction (*Continued on page 6*)

NEXT MONTH'S COVER
GRUMMAN WILDCAT

PLANE ON THE COVER

For 12 years, the great Al Williams put on exhibitions of stunting here, abroad. Ship took part experiments, tests, flew millions of miles. Williams toured air fields during war to demonstrate airmanship. German ace Ernst Udet only other man to fly it; he let Williams fly Me-109 as swap before war. Roosevelt Field (gone) shows below.

OK CUB .049A

NEW!
POWERFUL!
COMPLETE!

Brand New Design!

. . . special for control line flying. Lightweight, oversize fuel tank gives you winning range and power, plus greater output on a power/weight ratio. Mounts flush on the face of your plane. Comes complete with prop, spinner and super-capacity fuel tank.

$4.95

OK CUB .049B

Here's a flashy performer with plenty of power for general flying. Has both radial and lug mountings. It's versatile, comes already assembled. Complete with fuel tank, prop and spinner.

$4.95

OK CUB .049B Power Kit

KNOW your engine . . . assemble it yourself! Learn your engine from the inside out . . . and save $1.00! Includes all the parts and complete instruction for assembling the Cub. 049B.

$3.95

SEE YOUR DEALER . . . OR WRITE DIRECT

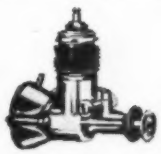
For PRICE, POWER, and PERFORMANCE

10TH ANNIVERSARY OK 1937 • 1955

A Complete Line of PROVED Miniature Engines and Accessories

"OK" GLOW FUEL
"OK" DIESEL FUEL
Pint 85¢

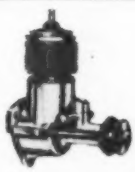
"OK" GLOW PLUGS
Short or long —
59¢



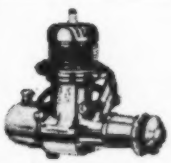
"OK" CUB .049X
$5.75

"OK" CUB .074
$5.95

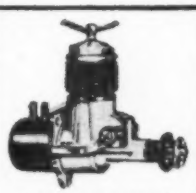
"OK" CUB .099
$6.95



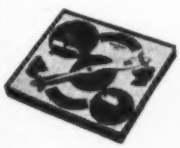
OK" CUB .14 $7.95
"OK" CUB .19 8.95



"OK" HOTHEAD
$10.95



"OK" CUB DIESELS
.049 $5.95
.075 7.50



"OK" COMBINATION PACKAGES

CUB .074..... 6.75
CUB .099..... 7.75

HERKIMER TOOL & MODEL WORKS

88 HARTER STREET — HERKIMER, N. Y.

WORLD'S LARGEST HOBBY MAIL ORDER HOUSE . . . SINCE 1931

... the HOBBYIST'S SUPERMARKET of SUPER SAVINGS!

NEW ITEMS ... if available anywhere **WE'VE GOT EM!**

NOWHERE IN THE WORLD will you find as large a selection of AIRPLANES • ENGINES • SPEEDBOATS RACE CARS • ACCESSORIES • ETC. CHECK THIS LIST!

LOOK! Only AHC Gives You All These Terrific EXTRAS

1. One year subscriptions to Model Airplane News, Air Trails and Flying Models or their equivalent value to our regular customers.
2. 14-Day Money Back guarantee on unused purchases.
3. BONUS ITEMS with every engine purchased! ITEMS INCLUDE: Correct Size Propeller, Glo Engine Handbook, etc., etc.
4. BONUS with gas planes (selling at over $1.50) . . . Control Lines, Construction Manual, Rubber Wheels, Insignias, etc.
5. No postage or packing charges for orders of over $2.00 (include 25c if order is under $2.00). We insure safe delivery ANYWHERE IN THE WORLD. Outside of U.S.A. (except APO & FPO) add 10% for postage (minimum 50¢).
6. Membership in "Modelcrafters of America," the club that keeps you up to date on gas modeling and SAVES YOU MONEY ON YOUR PURCHASES. Over 100,000 members!
7. No "minimum" orders. Any order is welcome.
8. 24-hour service. Mail addresses coast-to-coast airmail your orders to our N. Y. office for immediate shipment to you.
9. Most complete model stock in America—gas, rubber, solids, etc. If it's advertised, we can usually supply it.
10. Competent understanding of your modeling problems.
11. 64 page giant 2-color illustrated catalog FREE with every order.

SATISFACTION GUARANTEED OR YOUR MONEY BACK

ENGINES

GLO ENGINES	
Atwood Cadet .049 UC (AA)	4.95
Atwood Cadet .051 UC (AA)	4.95
Atwood F.F. .049 (AA)	5.75
Atwood F.F. .051 (AA)	5.75
Atwood Signature .049 (AA)	6.75
Atwood Signature .051 (AA)	6.75
Atwood Triumph 49 (C)	18.00
Cameron Ring (A)	9.95
Cameron Lapped (A)	9.95
Cameron .19 two speed (A)	11.95
Forster F.29 Glo (B)	11.20
Forster F.31 Glo (C)	11.20
Fox 19 (A) 12.50; 2 Speed	13.50
Fox 25 (B) 12.50; 2 Speed	13.50
Fox 29 (B) 14.95; 2 Speed	17.45
Fox 35 (C) 14.95; 2 Speed	17.45
Fox 59 (D) 22.50; 2 Speed	24.00
Infant Torpedo (AA)	5.50
K & B Glo Torp 29 (B)	15.95
K & B Glo Torp 35 (C)	14.95
K & B Torpedo 19 (A)	13.95
K & B .15 (2-speed) (A)	11.95
K & B 19 (2-speed) (A)	16.95
K & B Torpedo 23 (B)	13.95
K & B Torpedo 15 (A)	10.95
McCoy .049 (AA)	4.95
McCoy 9 (A)	7.95
McCoy 19 Super Stunt (A)	9.95
McCoy 19 R.H. (A)	12.95
McCoy 29 Super Stunt (B)	11.95
McCoy 29 R.H. (B)	16.95
McCoy 36 (C)	12.95
McCoy 60 R.H. (C)	24.95
O & R .049 Midget (AA)	6.95

Buried in This Ad are most of the new items. Sometimes there isn't time or space to list all of them. But, if available anywhere, we have it.

O & R 23 Rv Deluxe (B)	11.95
O & R 29 Glo (B)	13.95
O & R 33 Glo (C)	13.95
O & R 60 Glo (D)	14.95
O.K. Cub .099 (A)	6.95
O.K. Cub .099 Pkge. (A)	7.75
O.K. Cub .049A Pkge. (AA)	4.95
O.K. Cub .049B Pkge. (AA)	4.95
O.K. Cub .049B Kit (AA)	3.95
O.K. Cub .074 (AA)	5.95
O.K. Cub .074 Pkge. (AA)	6.75
O.K. Cub .14 (A)	7.95
O.K. Cub .19 (A)	8.95
O.K. Cub .29 (B)	11.95
O.K. Cub .35 (C)	12.95
O.K. Hothead Glo (B)	10.95
Sky Fury .049 (AA)	4.95
Space Bug (AA)	6.95
Space Bug Jr. .049 (AA)	4.95
Spitfire .049 (AA)	4.95
Strato Bug .049 (AA)	5.95
Thermal Hopper (FF) (AA)	6.95
Veco .19 (A)	9.95
Veco 29 (B)	14.95
Veco 35 (C)	14.95
Wasp (FF) (AA)	6.75
Wasp (U-C) (AA)	6.80
Wen-Mac .049 Pkge. (AA)	6.98
DIESEL ENGINES	
Bambi .009 (AA)	24.95
Dart .03 (AA)	12.95
Javelin .09 (A)	12.95
McCoy .049 (AA)	5.95
McCoy .09 (A)	7.95
O. K. Cub .075 (AA)	7.50
O. K. Cub .049 (AA)	8.95
Spitfire .06	12.95
IGNITION ENGINES (Free Coil, Condenser, Etc. Included)	
O & R 23 RV Deluxe (B)	12.95
O & R 29 Rotary (B)	14.95
O & R 33 (C)	14.95
O & R 60 Luxe (D)	15.95
Wasp Twin (D)	29.50

SAVE with AHC's famous ENGINE TRADE IN SERVICE

We meet all competition! If anyone advertises a higher trade-in allowance in this issue, clip the ad and send it to our N.Y. office with your order. BONUS ITEMS INCLUDED AT NO EXTRA CHARGE. Your old engine is worth 25% of the amount of your purchase. Only 1 engine accepted per order.

MARINE ENGINES	
Allyn Mer-Fury .049 (AA)	5.95
Atwood Inbd. Air Cooled (AA)	5.50
Atwood Inbd. Wat. Cool. (AA)	5.75
Atwood Obtd. Air Cool. (AA)	9.95
Atwood Obtd. Wt. Cool. (AA)	9.95
Cameron .09 Marine (A)	9.95
Cameron .09 Marine Dbleist (A)	11.95
O & R 29 Marine (B)	14.95
Sea Fury Outboard .049 (AA)	9.95
Sea Fury Inboard .049 (AA)	9.95
We carry all the Allyn Fury engines	
JET ENGINES	
Dyna-Jet Redhead	35.00
Sona Jet	14.95
Mew 307	11.45
Jetex Atom 35	1.75
Jetex 50	1.95
Jetex 50B Contest Sal.	2.95
Jetex 150	4.95
Jetex Scorpion 600	8.95
Mew 601	1.10
Pat 50	1.20
Turbo-o-Prop	2.49
ELECTRIC MOTORS	
Dynamite	1.98
Speed Reduction Unit	.98
Outboard	2.95
Mercury Outboard	1.29
A.H.C.	1.50
AHC Pee Wee	1.25
Pittman	6.50 & 8.50
Johnson or Evinrude Outboard	4.95
Also all K & O, etc.	

AIRPLANES

U-CONTROL PLANES

Aeronca Sedan 35¼" A-B-C	4.95
Aeronca Sedan 22" AA	1.95
Air Racer 18" AA-A	3.39
All Amer. Trainer 21" AA	1.95
All Amer. St. Trainer 30" A-AA	2.95
All Amer. Stunt 36" A-B	4.95
All Amer. Sr. Stunt 51" B-C	5.95
American Boy 18" AA	1.00
Baby Barnstormer 23" AA	2.95
Baby Clown 22" AA	1.50
Baby Era 18" AA-A	2.50
Baby Era Bipe 16" AA	2.50
Bambino 24" AA	3.95
Barnstormer 47" A-B	5.95
Bearcat 35" C-D	4.95
Beechcraft 16" AA-A	2.95
Bel-Air 18" AA-A	2.95
Bipe Stunt Train. 22" B-C-D	3.95
Boeing F4B4 17½" AA	2.95
Boeing P26A 18" AA	2.95
Bravo 36" A-B-C	4.75
Cessna 180 18" AA	1.50
Cessna Birddog 18" AA	1.50
Cessna 22" AA	1.95
Cessna 36" B-C	5.95
Chief 53" B-C	4.95
Circus Prince 27" A-B	1.95
Circus King 40" B-C	2.95
Continental 40" A-B	4.95
Corsair 17" A-AA	2.95
Corsair 36" B-C	5.95
Curtis P40F 20" AA	3.95
Curtiss Hawk P6E 17½" AA	2.95
Curtiss Hawk P6E 23¾" A	4.95
De Haviland Beaver 48" AA-A	4.95
F & B Basic Trainer 25" A-B-C	2.95
Fire Baby 19" AA	2.50
Firebaby Biplane 19" AA	3.50
Firecat 42" AA	4.95
Flying Clown 28" A-B-C	1.95
Focke Wolfe 190 17" AA	2.95
Fokker D-VII 32½" UC A-B-C	5.95
Fokker D7 14" AA	2.95
Fokker Triplane 14" AA	2.95
Forty-Niner 15" AA	1.95
Good News 30" A-B-C	5.95
Great Lakes Trainer 27" A-B	5.95
Grumman Guardian 50" A-B-C	6.95
Guided Star 24" A-B-C	5.95
Guided Starlet 24" AA	2.75
Hell—Razor 9" AA	2.00
Hell—Razor 14" A	5.95
Hell—Razor 15" B	6.50
Hell—Razor 18" D	6.95
Howard Ike 20" AA	3.00
Howard Pete 30" B-C-D	5.95
Infant Wagon 20" AA	1.95
Jumping Jack 33" A-B-C	2.75
Junior Puddlejumper 19" AA	1.95
Junior Stunt 9 27" AA-A	3.48
Kellett Autogiro 18" AA	1.95
Kenhi Panther 48" B-C	6.95
Kenhi Wildcat 37" A-B	4.45
Kenhi Bobcat 37" A-B	3.95
Kenhi Cougar 51" B-C	6.95
Key 29" B-C	5.95
Key—Dot 18" AA-A	2.95
Lil Duper Zilch 42" A-B	3.95
Lil Rocket 15" AA	1.95
Lion Tamer 40" B-C	3.95
Little Ace 18" AA-A	1.95
Little Bipe 16" AA-A	1.50
Little Devil 18" AA-A	1.80
Little Mercury 18" AA	1.80
Little Mustang 18" AA	1.95
Little Sabre 18" AA	1.95
Little Schmoo 17" AA	1.80
Little Stinker 16" AA	2.50
MPC-7 39" B	6.95
Mentor T-34A 33" A-B	5.95
Mini-Whirlaway 8" AA	2.95
Minnow 28" A-B-C	5.95
Mini-Zilch 19" AA	1.25
Monocoupe 36" B-C	4.95
Monocoupe 18" AA	1.50
Mr. Mulligan 32" B-C (Sterling)	4.95
Mustang 37" A-B (Berkeley)	5.95
Mustang (Sterling) A-B-C 38"	2.95
Mustang (Veco) 48" B-C	7.95
Mustang (Monarch) 20" AA-A	3.95
N.A. P51 16" AA (Comet)	2.95
No. Amer. AT6 (SNJ) 31" A-B-C	4.95
No. Amer. AT6 18" AA	1.95
N. A. Savage 26" AA	6.95
Papoose 32" A	3.95
Peter Pan 16" AA	1.50
Piper Cub Cruiser 18" AA	1.80
Piper Cub 22" AA	1.95
Piper Tripacer 44" AA-A	5.95
Pitts Special 26" A-B	4.95
Polish Fighter 36" B-C-D	5.95
Primer 18" AA	1.40
PT Trainer 26" A-B	1.99
Quest 30" B	4.95
Reactor 46" A-B-C	3.50
Redskin 31" A-B	4.95
Ringmaster 42" B-C	2.95
Ringmaster Jr. 30" AA	1.95
Rookie Trainer 36" B-C-D	3.80
Ryan S.T. 36" B-C	5.95
Ryan S.T. AA 17½"	2.50
Sabre 21" AA	2.95
Scientific 2 in 1 Kit 18" AA	1.50
Scout 24" AA	2.50
SE 5 17" AA	2.50
SE 5 14" AA	2.95
SE 5 32" B-C-D	5.95
Secret Weapon 24" AA-A	1.95
Sherpy 47" C-D	4.95
Shoestring 28" A-B-C	5.95
Smoothie 52" A-B	7.95
Speedster 12" AA	2.95
Spirit of St. Louis 26" A-B	4.95
Spirit of St. Louis 18" AA	1.50
Spitfire 20" AA	3.95
Spitfire 18" AA	2.95
Sport Racer 18" AA	1.50
Sportwing 36" A-B-C	3.95
Squaw 39" A-B-C	6.75
Stearman 14" AA	2.95
Stinger 40" B-C-D	6.50
Stinson 22" AA	1.95
Stuntmaster 18" AA	1.50
Super Cadet 35" AA	2.95
Super Clown 38" B-C	2.95
Super Duper Zilch 52" C-D	5.95
Super Knock-Out 24" A-B	3.50
Super Puddlejumper 28" AA-A	3.95
Super Squirt 21" (Jet)	5.95
Super Whirlaway 12½" A-B	4.95
Super Zenith 23" A	3.50
Sweet Chariot 18" AA-A	2.50
T-28 N.A. Trainer 30" B.C.	5.95
Thunderbolt 40" C-D	4.95
Thunderbug 18" AA	1.50
Tom-Tom 40" B-C	3.95
Tomahawk 40" A-B-C	2.95
Trister Improved Trainer	3.95
Trister Profile 32" A-B	2.50
Trister Profile 38" B-C	3.50
Trixy 46" A-B-C	4.95
Twin Jumping Jack 33" A-B	3.95
Twin Mustang F82—18" AA	2.95
Typhoon 17" AA	2.95
Vampire 40" B-C	4.50
Viking 51" C-D	6.75
Vitamin 16" AA	1.75
Vixen 21" AA	1.95
Waco 33" B-C	5.95
Waco Cabin 12" AA	1.80
Warhawk 17" AA-A	1.95
Warhawk 32½" B-C	5.95
Warhawk Berk. 45" A-B-C	5.95
Warrior 36" A-B-C	4.95
Wee Duper Zilch 34" AA	2.95
Wee Willie 18" AA-A	1.95
Whirlaway 18" AA	1.50
Yak (Sterling) A-B-C	2.95
Zero 18" AA	2.95
Zilch X-Pendable 38" A-B-C	3.95

FREE-FLIGHT PLANES

Amazon 62" A-B	4.95
Bird Dog 36" FF AA	2.95
Bootstrap 40" AA	2.50
Buccaneer B Special 54" B	3.95
Cessna 180 35" AA	2.95
Champion 36" A-AA	2.50
Clipper 34" AA	1.95
Cloud-Copter TR 25" AA	3.50
Cloud-Copter D2 26" AA	2.95
Commanche 36" AA	2.75
Dakota 24" AA	2.75
Folly 32" AA	1.75
Fu-bar 36" AA	1.95
Fu-bar 66 66" B-C	6.95
Kenhi Badger 72" A-B-C	5.95
KIWI 35" AA	2.50
KIWI 44" A	4.50
Lift Master 34" AA	2.25
Lil Rascal 27" AA	1.50
Lockheed Starfire 23" Jetex	2.49
Luscombe Sedan 76" C-D	9.95
Mini-Hogan 34 34" AA	1.95
Mini-Hogan 45 46" AA	2.95
PAA Master 35" AA	2.50
Pacemaker 40" AA	2.50
Paveo 50" (.049)	2.95
Powerhouse 41" A	3.95
Privateer Flying Boat 36" FF AA	2.95
Profile Powerhouse 24" AA	1.00
Sandy Hogan 70" B-C	6.95
Shadow 32" AA	1.95
Sioux 36" AA	2.75
Sniffer 29" AA	1.95
Super Brigadier 58" B	4.95
Super Yank 27" AA	1.95
Taylor Cub 35" AA	2.95
Vengeance 41" A-B-C	2.95
Zeek 33" AA	2.50
Zeek 50" A-B	4.95
RADIO CONTROL PLANES	
Helioplane 39" AA	3.95
Piper Tri-Pacer 58" A-B-C	10.95
Bootstraps "A-RC" 54" AA-A	4.95
Kenhi Buzzer'd 72" A-B-C	10.95
Kitten 34" AA	3.95
Livewire RC 48" AA	6.95
Royal Rudderbug 62" A	6.95
Livewire Sr. 66" A	14.95
Livewire Cruiser 66" A-B	14.95
Buccaneer B Special 54" B	3.95
Super Brigadier 58" B-C	4.95
Super Buccaneer 90" C-D	12.95
Custom Cavalier 108" D-E	17.50
Luscombe Sedan 76" C-D	9.95
Jasco R/C Electra 45" AA	4.50
Cessna 170 72" B-C	10.95
Custom Privateer 114" D	19.95
Piper Cub J3 71" A-B	8.95
De Haviland Beaver 48" AA	4.95
Piper Tripacer 44" AA-A	5.95
Mambo Trainer 48" AA-A	5.95
READY-TO-FLY PLANES Complete With Engines	
Aeromite 17" (Assembled)	9.95
AJ Firebaby 19" (Assembled)	7.85
Firebaby Biplane 19" (Assembled)	9.75
TD1 24" AA	9.95
TD1 (with motor)	15.95
TD-1 24" (Assembled)	19.95
Sabre 44 (Assembled)	9.95
Cox TD3 (Assembled)	10.95

MODEL BOATS

Chris-Craft Challenger 33" C-D	9.75
Chris-Craft Express 25" BCD	5.75
Chris-Craft Runabout 25" BCD	6.25
Vineyard 28" BCD	6.25
Buckeye Jr. 13½" AA-A	3.95
Buckeye Cabin Jr. 13½" AA-A	3.95
Little Buckeye 12" AA	1.95
C.C. Riviera 12" AA	2.95
C.C. Riviera 12½" AA-A	3.50
C.C. Catalina 31¼" A-B-C	11.95
C.C. Outboard Cruiser 18" AA	2.95
C.C. Motor Yacht 40" A-B	18.95
Sea Dart 16" (Outboard)	3.95
C.C. Outboard Cruiser 16"	3.95
Richardson Sedan 17" AA-A	5.95
Sterling C.C. Bucc 19" AA-A	7.95
C.C. Exp. Cruiser 14" AA-A	3.50
Sea Maid 27" A-B	7.95
C.C. 21" Express AA	2.95
C.C. 21" Sportsman AA	2.95
Century Seamaid 12" AA	2.95
C.C. Cruiser 28" Radio Con. A-B	9.95
XP-300 Dream Boat 12" AA	1.95
Sea Bird RC 28" AA-C	3.95
Sea Bird 14" AA	1.95
Atwood Speedster (with engine)	14.95
Aquamite (with engine)	9.95
We HAVE all the new outboards	

RADIO CONTROL

Super Aerotrol "Ready to Operate" Includes Transmitter, Antenna, Receiver, Escapement, Meter, Tubes. Everything to operate & maintain except batteries	49.95
Same as above in kit form (no meter, tubes or escapement)	29.95
Aerotrol Manual 1.00; Escapement	2.95
Berk. DE Relay	7.50
Super Aerotrol Receiver Kit	13.95
Super Aerotrol Rec. Assb'ld	22.95
Super Aerotrol Transmitter Kit	19.95
Super Aerotrol Trans. Assb'ld	27.95
Super Aerotrol Escapement	3.95
Berkeley Radio Control Book	1.00
Babcock Super Comp. Escap.	7.95
Babcock Transmitter 39.95; 3 ch.	69.00
Babcock Receiver 29.95; 3 ch.	86.00
Citizenship Receiver 24.95, 29.95 &	34.95
Citizenship Receiver Kit	19.95
Citizenship Transmitter	34.95
Citizenship Escapement	5.95
Cameron SN Escape (2 pos.)	5.95
Cameron SN Escape (4 pos.)	8.95
Cameron Compound Escapement	8.95
ECC Transmitter (complete)	27.95
ECC Receiver	21.95
ECC Escapement	8.00
ECC Relay	7.95
Test Meter (Citizenship)	19.95
Motor Control Unit	14.95
Bellcrank & Horn (RC)	.75
U-15 Battery Box 1 cell, 30; 2 cell	.50
Battery Box 1 Cell, Specify Bat.	.20
Battery Box 2 Cell, Specify Bat.	.40
Battery Box 3 Cell, Specify Bat.	.60
Battery Box 4 Cell, Specify Bat.	.75
3A5 Transmitter Tube	2.25
XFG1 Receiver Tube	3.50
Zero 3 Milliammeter	3.50
Zero 50 Milliammeter	2.75
Tornado R.C. Props:	
10" in 2, 3, 4 p	.35
11" in 3, 4, 5, 6 p	.45
12" in 3, 4, 5, 6 p	.46
Also All R.C. Parts and Batteries and anything advertised	

RACE CARS

Automite with Wen Mac Engine	10.95
Half-pint	2.95
Rodzy Complete with Engine	16.95
McCoy with Engine	24.95
McCoy Nike Rocket w/Engine	9.95
O & R 6.95; with Engine	24.95
Prop Rod with Engine	9.95

ACCESSORIES

PROPELLERS	
Tornado	
5" D 3-4-5-6-7-8 P	.15
6" D 2-3-4-5-6-7-8 P	.15
7" D 2-3-4-6-8-9 P	.20
8" D 3-4-5-6-8 P	.25
9" D 3-4-5-6-7 P	.25
10" D 3-5-6 P	.30
Scamper Plastic 5½" 3p., 6" 4p.	.15
9" 4p., .45 10" 10p., 11" 8p.	.46
Keyson plastic 8/3, 8½/4, 6/3, 6/4, 6/5 —15c; 7/4	.20
Top-Flite—6" in 3,4,8p—20c; 7" in 3,4, 6p; 8" in 3½, 5,6,8p; 9" in 4,5,6,7, 8p; 10" in 3½, 5,6,8, 12p—25c; 11" in 4,6,8,10,12p; 12" in 5,8p; 13" 8½p; AND ALL OTHERS!	
METAL GAS TANKS	
Darwin Bros Stunt Tanks:	
Pee-Wee (⅝" w. ½" h): 1", 1½", 2", 2½" ea.	.50
B (1⅛" w. ¾" h): 1½", 2", 2½", 3" ea.	.75
L (2⅛" w. 1⅜" h): 1½", 2", 2½", 3", 3½", 4" ea.	1.00
Fraom:	
#20 (1" w. ¾" h): 1⅛", 1½", 1¾", 2⅝" ea.	.65
#21 (2" w. 1" h): 2½", 3", 3½", 4" ea.	.95
Berbelov: AA—.59; A—.75; B—.75; C—.85; D—.85	
Pylon Plastic: Sm. .75; Med. 95; Lg.	1.25
SPARK & GLO PLUGS	
Champion Glo V, V2, V3	.75
Champion Spark V, V2, V3	.80
McCoy Hot Point	.65
O & R Glo (V or AA)	.65
O.K. Glo-plug (V2 or V3)	.59
K&B V2, V3 .65 — Cox Hotspot	.65
O & R Kwik-Start (AA, V, V2, V3)	.65
Veco V2 or V3	.65
IGNITION ACCESSORIES	
6 ft. Hook-up wire	.25
Austin Booster Plug-in	.35
Midget Switch: slide—.25 Toggle	.50
O & R Snap Pack	.35
Condenser .20; Smith Metal	.35
O & R Instant Clip	.15
Rogers Coil	2.00
Alligator Clips .10 — Wilco Coil	1.95
1½ Volt Battery	.90
Battery Conn. Cord Kit	.40
Battery Cable assembled	.60
PROP SPINNERS	
1¼"—70c; 1½"—90c; 2"	1.00
Plastic 1¼"—30c; 1½"	.50
Plastic 1⅝", 1¾", 2", 2¼"	.45
Also Wen-Mac, Austin, Fraom.	
WHEELS	
K&B Alum. Hub: 1"—30c; 1½"—40c; 2"—50c; 2½"	.60
Semi Pneumatic (pr) 2" 2½"—1.40; 3"—1.75	1.25
Sponge Rubber (pr) ⅜"-1" 30c 1¼"; 1¼" 35c 1⅜" 40c 1½" 45c 1⅝"—45c; 2⅝"	.85
Tail Wheels ½", ⅝", 1"	.15
Trexler Pneu. (pr) 1⅛" or 1½" 1¾", 2"—50c; 2¼", 2½"—60c 2¾" 1.00; 3" 1.35; 3½" 1.80	.40
Wheel Collars pr.	.15
Veco Wheel Ret. 1/8 or 3/32 pr.	.20
MISCELLANEOUS	
Glo Engine Handbook	1.00
Spitfire Glo Plug Clip	.15
Brass Tubing 1/16", 3/32", ⅛"	.20
Finger Guard .25 — Vibratec	5.00
Muffler (Lge. or Small)	1.25
Fuel Pump (pt. or ½ pt.)	.65
Marco Fuel Pump	.50
Pylon Fuel Bulb Pump 2 oz.	.59
4 oz.	.79
Handy Boy Fuel Dispenser	1.00
Pylon Engine Starter	1.95 & 2.50
Presto Disc Starter	.25
Metal Motor Mounts, Sm. .25; Lge.	.50
Black Neoprene Tubing, per foot	.30
Transparent Tube, (reg. or AA) ft.	.15
Spitfire Timer	2.95
Fuel-off Timer	1.95
Austin Exh. Stack, O.R. .19 to .29	.25
Hillcrest Fuel Shutoff	1.35
Keding Stop-it 1.25; Timit	2.25
D.E. Shutoff Valve	1.25
No. 70 oil, 3 oz—25c—pint	.60
Plastic Fuselage 19" set of 2	.50
Plug Wrench .25; 4 Way Socket	.60
Plywood 6"x12" 1/16"—25c; ⅛"—30c	
Silk per yd.: Red, blue, yel., orng.	1.50
Nylon (White or Yellow) yd.	2.25
Flexible Needle Valves; Cub, Royal Spitfire, Spitzy—49c; Wasp, Baby Spit, Infant, Torp Jr., Torpe 49—39c; Universal Needle Valve (A-B-C engines) 50c; Flexible	.75
Needle Valve Extension flexible	.25
McCoy Speed Needle Valve	.50
E-Z Running Stand	1.75
E-Z Minimount (½A)	1.25
Berkeley (½A) Test Stand	.39
Pilot Heads .05, .10 &	.75
Team Racer Pilot Head	.75
Sandpaper Packs .10 &	.20
Glue Gun .50 — Plane Kleener	.50
Bolts ½", ⅝", 1", 1¼", 1½", 2"	12/.20
Grant's Model Airplane Design	3.75
⅝" A.M.A. Decals	.10
Scoremarker Decals (100)	.15
Small Parts Case	.50
Aerogloss Plastic Balsa Tube	.30
Rubbing Compound .25 or	.40
Aerogloss Wax	.40
Rev-up	.50

DOPES (Con't U.S.A. Only)
We carry all lines of dope and cement: Aerogloss, Comet, Monogram, Testors.

U-C ACCESSORIES

Adjustable Push Rod Set	.25
BERKELEY control lines	
.004 or .006x2-35	.35
.008, .010, .012; 2'-58'	.50
.008, .010, .012, .014 2-70	.65
Stranded .015, .021 65' 1.00; 70' 1.25; 200'	3.50
PYLON control lines .008, .010, .012, .014, .016: 2-52'	.60
.010, .012, .014, .016, dia. 2-70' lines	.75
Flexible 2-52' 1.50; 2-70'	1.95
Berkeley Metal Flight Reel	1.25
Berkeley Metal Handle	1.00
Controliner Flight Reel (with handle & wire) AA—1.95; A-B	2.50
Elevator control horn .10, .25 &	.30
Elevator hinges: Cloth .10; Nylon	.15
Metal (4) .10; F&B (set)	.30
Stiff Lead-Out Wire .014; .020; .028; .032 (3 Ft.)	.25
Stiff Push Rod Wire ½A	.10
Kenhi Pushrod Keeper	.10
Nylon Lines AA	.35
Pylon Bellcrank 2"—.20; 3"	.25
Conn. Clips A, B, C or D 2 for	.10
Plastic Handle 5" or 6"	.85
T. D. Handy Reel & Handle ½A	1.80
T. D. Deluxe Reel & Handle	2.95
Stunt Bellcrank & Elev. Horn	.25
Swivels, small 15c pr.; large	.20
Handy Reel (Consol)	2.95
Handy Safety Thong	.75
U-Reely Contr.—7.80; cable	8.50
Veco Bellcrank 2"—.25; 3"	.30
Wood Control Handle	.25
Darwin Metal Control Handle	1.25

SPECIAL BONUS OFFERS

BONUS ITEMS FREE of extra cost with every **GAS ENGINE**
Bonus items include: Correct Size Propeller, Glo Engine Handbook, Mounting Nuts and Bolts, etc. FREE of extra cost.

BONUS ITEMS FREE of extra charge with **GAS PLANES** selling at over $1.50 only
Bonus items include: Control Lines, Gas Model Construction Manual, Correct Size Rubber Wheels, Insignias, etc. FREE of extra cost.

WE MATCH ANY OFFER

AHC matches any offer made by any other advertiser. Attach ANY ad in this issue to your order — and take advantage of the AHC "extras."

ORDER NOW! Get all these AHC "EXTRAS"

Why Order from any Manufacturer?

We carry in stock all the planes, motors, etc. of every manufacturer advertising in this magazine.

ORDER from AHC and GET FREE Postage & Insurance FREE PREMIUMS FREE Membership in MODELCRAFTERS of AMERICA

25 mfgrs. CATALOGS FOR ONLY **$1**

Sterling Models, Ideal, Berkeley Models, Scientific, Herkimer (OK), Comet Models, Cox (Thimble-Drome), Consolidated, Hawk Models, Guillow, Testors, Revell Plastics, Austin, Henry Eng. (Veco), Monarch Models, Aurora Plastics, Monogram, Kenhi, F&B Models, McCoy, Xacto, etc., etc.

Sale

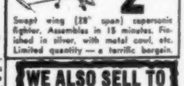
SAVE TO 50% on these limited quantity Discontinued Models
All models in A-1 condition ... guaranteed by AHC's famous money-back guarantee.

ATWOOD CADET .049 GLO ENGINE For U-Control Reg. $3.95 **2.95** LIMITED QUANTITY

TOPPER TOPPER I 16" Cl. A-B-C Reg. $2.25 **1.15** TOPPER III 20" Cl. B-C Reg. $3.00 **1.50**

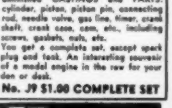
An excellent U-Control model with planked fuselage, wings solid, tapered to shape.

U-C TETHER SHARPIE



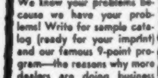
18" Class A-B Reg. $2.00 **1.00**

Cleveland Streamliner



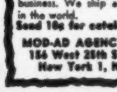
Twin boom U-C model. A speedy nacelle, streamlined job. 25" Cl. B-C-D Reg. $4.00 **2.00**

BABY FLEETSTER 32" .020 TO .049 Free Flight Model



Reg. $1.25 **75¢**

"F-65" U-Control Model Reg. $5.95 **2.50**



Swept wing (28" span) supersonic fighter. Assembles in 15 minutes. Finished in silver, with metal cowl, etc. Limited quantity — a terrific bargain.

SOUVENIR BARGAIN

The manufacturer of a well-known engine, after selling 30,000 at $9.95 has decided to go out of production. We made a special purchase of his remaining 1,000 complete sets of finished and unfinished CASTINGS and PARTS: cylinder, piston, piston pin, connecting rod, needle valve, gas line, timer, crank shaft, crank case, cam, etc., including screws, gaskets, nuts, etc.
You get a complete set, except spark plug and tank. An interesting souvenir of a model engine in the raw for your den or desk.
No. J9 $1.00 COMPLETE SET

WE ALSO SELL TO DEALERS

We know your problems because we have your problems! Write for sample catalog (ready for your imprint) and our famous 9-point program—the reasons why more dealers are doing business with us. Includes our 60-day return privilege, etc. Special data if you are going into business. We ship anywhere in the world.
Send 10¢ for catalog, etc.
MOD-AD AGENCY, Inc.
156 West 25th Street,
New York 1, N. Y.

HOW TO ORDER

Send payment in full. No stamps, no C.O.D.'s.
Address your order to us at the branch office nearest to you:
156M West 25th St., New York 1, N. Y.
55M E. Washington Street, Chicago 2, Illinois
Rm. 230M, 742 Market St., San Francisco 2, Calif.

READ THIS ENTIRE MAGAZINE FROM COVER TO COVER EVERYTHING ADVERTISED CAN BE ORDERED FROM AHC

Branches Coast-To-Coast

AMERICA'S HOBBY CENTER, Inc.

1931 **24th YEAR** 1955

America's Largest Source of Models & Supplies

RED HOT BUYS

SPECIAL BONUS OFFER

BONUS ITEMS FREE

Free of extra cost with every complete flying outfit of plane and engine.

Correct Size Finished Propeller — Engine Handbook — 18" Insulated Ignition Wire — Insignias — Giant Book on Construction — How to Build and Fly Them — Cement — Sandpaper — Metal Bellcrank with Bolt, Nut and Washer — Elevator Horn — Elevator Hinges — Lead-In Wire — Push-Rod Wire — U-Control Handle — U-Control Stainless Steel Wire and Reel.

NOTE! You may substitute any plane or engine of equal value for any plane or engine included in these offers. Take your choice from listings on opposite page.

Buy your engine and plane from us at the same time and get all your accessories free!

ORDER NOW! GET ALL THE AHC "EXTRAS"

COMPLETE FLYING OUTFITS
BIG $10. VALUE

Take your choice of one of these scale U-Control models. Each is completely prefabricated — easy to assemble and fly!

NOW ONLY $7.50

PLUS ATWOOD .049 OR PLUS O.K. CUB .049 PLUS ALL ACCESSORIES AND BONUS EXTRAS

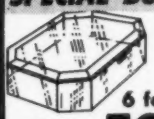
49¢ Reg. $1.00
Babcock U-C Reel

Save over 50%. 6" diam. Turned hard maple reel with knobs, wire guides.

½A Engine Starter 15¢

Pulley type for engines to .099. Aluminum. Notched for easy cord starting. Gives flywheel starting action.

SPECIAL BUY



WAS 13¢ ea. **6 for 50¢**

AHC PARTS BOXES

Handy transparent plastic parts boxes with hinged tops. Measures 1¾" x 2¼" x ¾" high. Ideal for small parts storage.

Stunt, Wedge Type TANKS 39¢

Reg. 85¢
Std.—1.9 oz.—1x2x2
Super—2.25 oz.—1x2x2½

DOPE BRUSHES

$3.00 VALUE
20 for $1.00 Asstd.

Believe it or not! 2 COMPLETE PLANES Make and fly BOTH these 18" profile models

BIG $10 OUTFIT FOR ONLY $5.99
With O & R Colt .049—$5.99

SUPER SAVINGS

REG. $16.50
O & R 60 SIDEPORT ENGINE

Save almost $7.00 on this discontinued engine. They're Brand New & Fully Guaranteed. Your choice of ignition or glo.

9.95

FREE 6 matching O&R 45c props Free of extra cost with engine.

O & R GLO PLUGS

For ½A Eng. Closeout
Reg. 65c ea. **29¢ ea.** 4 for $1.00

Electric Motors 1.25

U.S. made. 1" x 1⅝" x 1⅝" high.
REG. $1.98
Imported Motors, 1½ to 3 Volt — SPECIAL 98c

½A U-Control WIRE 20¢

35 Ft. on Reel
REG. 35¢

ACCESSORY KIT Reg. $1.00 39

Foil paper, brush, decals, etc.

"Model Aircraft Plan Book" 50¢

132 pgs. by Bill Winter
REG. $1.00

TRIM-FILM 98c

8 asst. Solid Color
REG. $2.00

SPECIAL

$1 DECAL BARGAIN

Just look what you get: 1⅛" AMA decals, 62 black decals (2 complete sets of numbers plus alphabet and extra letters), 1 set of 4 star & bar 2", 6 picture decals 2" x 4", 3 sheets of solid colors, 1 sheet checkerboard decals, 6 strips of solid color, plus Tips and Hints on use of decals. A REAL BARGAIN . . . WORTH MANY $$$$.

SPECIAL

8 for **$1**

High Grade Propellers

Testor's. Reg. 35c to 50c each. 8" in 10, 12p; 9" in 10, 12p; 10" in 10p; 11" in 10p.

SAVE

Souvenir Engines

75¢

3 for $2.00

Limited quantity of "junk" engines. These are sold as-r, without guarantee. Some have broken castings, broken or missing plugs, defective timers, etc. They make an interesting display for your den or desk.

CLOSEOUT SPECIALS

Planes, Speedboats, Etc.

Royal Skimmer speedboat, 13" assembled & painted with fuel proof dope. For ½A eng. or elec. motors
Reg. $5.95 ..... SALE $1.50

U-Control "Junior 9"
Reg. $3.40 ..... SALE $1.75

U.C. Stunt "Tiger U-Shark" Class C.
Reg. $4.95 ..... SALE $2.98

F.F. "Diamond Demon"—48" S
Reg. $2.95 ..... SALE $1.80

F.F. "Jersey Javelin", high wing on built-up fuselage, enclosed landing wheel—48" span, class B
Reg. $3.95 ..... SALE $1.95

Grab-bag of 6 asst. plastic plane models. All different & including 2 paint colors cement, brush, stands, etc.
SALE 6 for $1.79

BIG SAVINGS
Deluxe Flying Outfits

Your choice of

Monarch's famous "SPITTIN' IMAGE" 20" wingspan control-line models. Extra deluxe kits PERFECTLY and COMPLETELY PREFABRICATED. Beautiful models you will be proud to fly. A cinch to build and fly!

PLUS SKYFURY .049 ENGINE PLUS ACCESSORIES AND BONUS EXTRAS

$15. VALUE FOR ONLY $9.95

SPECIAL!

Cleveland Model & Supply Co.

RIVIERA RUNABOUT

Your CHOICE of the SCIENTIFIC 12" model (featuring one-pc. carved balsa hull) or BERKELEY'S 12" model (prefabricated parts) . . . both terrific Speed-boat "thrillers".

PLUS O.K. CUB .049 ENGINE or ELECTRIC MOTOR

PLUS Every accessory you need, including: all metal parts—flywheel and propeller, drive shaft, etc. PLUS 15 bonus "EXTRAS" at no extra cost!

BERKELEY RIVIERA with Cub .049 $7.95 / with Electric Motor $4.50

SCIENTIFIC RIVIERA with Cub .049 $8.50 / with Electric Motor $4.95

SOLDIERS! SAILORS! MARINES! Orders placed through us get special attention. We understand your problems and take special care of your orders. No postage or packing charges on orders for over $2.00

CANADIANS & FOREIGN MODELERS! You save plenty by ordering from us. We accept your currency at market value. Canadian - $1.05; Sterling - $2.70; N.Z. - $2.35; Australian - $2.00; Philippine Peso - 33¢; etc. Add 10% for postage and packing (minimum 50¢).

EVERYTHING
anywhere in this magazine can be ordered from AHC

VISIT OUR FABULOUS "HOBBY CITY"

In the heart of New York

Everything under the "modeling sun" . . . under one roof. If it's available anywhere in the world, you'll find it here. Choose from the world's largest stock - including the smallest engine parts.

156 West 25th Street, New York 1, N. Y.

EXPERTS ON HAND AT ALL TIMES . . . THEY'RE HERE TO HELP YOU!

24 HOUR SERVICE

SAVE TIME!
USE THIS HANDY ORDER FORM

Branch offices, conveniently located coast-to-coast, airmail your orders to our N. Y. headquarters for immediate shipment.

GUARANTEED
Safe Delivery Anywhere in the WORLD

HOW TO ORDER

Send payment in full. No stamps, no C.O.D.'s. Address your order to your nearest AHC branch office. Include 25¢ extra if order is under $2.00.

Please RUSH me the following:
PLEASE PRINT

AMERICA'S HOBBY CENTER INC.

156M West 25th St., New York 1, N. Y.
55M E. Washington Street, Chicago 2, Illinois
Rm. 230M, 742 Market St., San Francisco 2, Calif.

Name _____ Amount Enclosed _____

Street Address _____

City _____ Zone _____ State _____

Page	Quantity	Name & Description of Items	Cost Each	Total
			Total	

24 HOUR SERVICE AT ALL TIMES

ONLY 25¢ EACH

WORKBENCH EDITIONS of the famous Winston books (Reg. $1.00 each) for only 25¢ ea.

- ☐ GLO ENGINE HANDBOOK. Tells all about the theory and operation of glo engines
- ☐ CONTROL LINERS. How to build and fly them. Covers subject from A to Z.
- ☐ GAS MODEL PLANE CONSTRUCTION. The answers to every problem you will ever meet

---

DELUXE HOBBY CATALOGS

25¢ 64 page 2-color 9" x 6" catalog, fully illustrated. Over 10,000 items, including gas, glo, diesel, and jet engines, rubber powered planes, boats, cars, solids of all kinds, tools, engine parts, etc., etc.

10¢ Fine jumbo catalog of thousands of hobby items: Plans, boat, car, engines, accessories, solids, gas, rubber, etc., etc.

IMAGINE! BWM

A HIGH PRECISION DIESEL ENGINE

FOR PLANES & BOATS

Bore: .56"
Stroke: .64"
Weight: 3½ oz.
Capacity: .15 cu. in.
Power: .23 hp at 12,000 rpm

Spare Parts Available

$13.75 AT BETTER HOBBY STORES

Made by Famous German Craftsmen

AT A PRICE THAT'S COMPETITIVE WITH ORDINARY MODEL ENGINES

No Other Engine Gives You All These Advantages

- Terrific torque . . . carries heavy loads at top speeds
- Smooth running at all speeds
- Fast starting. Flash performance
- Written Guarantee
- Made of finest materials throughout
- Many important engineering advances
- Long-life, trouble-free operation

Give yourself a real treat with this high precision mechanical marvel. You'll get performance you never dreamed possible plus long life, trouble-free hobby satisfaction.

AT BETTER HOBBY STORES.
IF YOUR DEALER IS OUT OF STOCK
WRITE GIVING YOUR DEALER'S NAME.

MOEN TRADING CO.

225 W. 34th Street, New York 1, N. Y.

LATEST "CUSTOM MIDGET" RADIO

CUSTOM RECEIVER

SIGMA RELAY INCLUDED

CUSTOM ACTUATOR

CUSTOM TRANSMITTER BOX INCLUDED

ALL THREE $9.98

RECEIVER TUBE "IDLES" WHILE RELAY REMAINS IN UNENERGIZED STATE. (saving tube and battery)

TUBE CURRENT INCREASES and RELAY BECOMES ENERGIZED ONLY WHEN TRANSMITTER IS KEYED

SHOULD RECEIVER or TRANSMITTER FAIL WHILE IN USE MODEL COMES IN RATHER THAN FLYING OUT OF SIGHT (This new type of "Fail Safe" operation fully explained in our instructions)

Fully Re-Designed "CUSTOM RECEIVER" weight under 3 ounces including 10,000 ohm relay (relay included) plus Silver Ceramic Trimmer, midget resistors & condensors, Nylon Coat Coil wire etc. Uses one X F G I Tube which IDLES while relay not energized saving Tubes life, Batteries etc. "CUSTOM TRANSMITTER" 27 M C Exam. Free Band with pre drilled base etc. Transmitter box only 4¼" x 5¾" (Box Included) may be hand held or placed on Field. Has range of 1 mile or more. Full Drawings and instructions included. "CUSTOM ACTUATOR" of new magnetic priucipal operates both rudder and elevators or rudder alone off battery supply, no rubber used for Boats, Aircraft, or Cars of small ½ A size up to large 8 ft. models. You do not have to be a Radio Expert to assemble the 3 units, all parts are tagged and marked to correspond to drawings.

"CUSTOM MIDGET" RECEIVER TRANSMITTER and ACTUATOR..... $9.98 ☐

Also Available "STANDARD MIDGET I" Radio kit, this group of 3 units, same design as above, same Relay, Same type Transmitter and Actuator, The difference from above is the Receiver weight which is greater (slightly over 4 ounces) Heavier components used.

"STANDARD MIDGET I" RECEIVER TRANSMITTER and ACTUATOR..... $6.98 ☐

PLANS FOR THE "CUSTOM MIDGET" all three units... 50c ☐

BOOKS
"RADIO CONTROL OF MODEL AIRCRAFT" $3.98 ☐
"RADIO CONTROL OF MODELS"..... 2.50 ☐
"RADIO CONTROL SHIPS, BOATS, AIRCRAFT"..... 3.98 ☐

"SUPPLY SOURCE DIRECTORY" Tells where to obtain Relays, Tubes, Crystals, all types equipment low as 1/20th normal prices. $7.00 MERCHANDISE COUPON FREE with Directory..... price $1.00 ☐
"SPECIAL 10 FOOT TRANSMITTER AERIAL"...$1.00 ☐ SPECIAL 10,000 OHM SIGMA RELAY...$2.98 ☐

X F G I tube...$3.50 ☐	0 to 3 Milliammeter...$3.50 ☐	Soldering Iron.....$2.98 ☐	Black Crackel Finish Transmitter Cases		
3-A-4 tube..... 1.00 ☐	0 to 50 Milliammeter.. 2.75 ☐	Battery Tester, reads 0 to 2 Volts and 0 to 50 volts..... 2.98 ☐	4" x 2" x 3"....$2.98 ☐		
3-A-5 tube..... 1.35 ☐	Both Meters above.... 5.25 ☐		6" x 5" x 4"..... 3.25 ☐		
Keying Switch.. .50 ☐	Peterson 27.255 M C		6" x 6" x 6"..... 3.50 ☐		
Micro Switch.. .98 ☐	Z-9 Crystal..... 4.85 ☐	Electric Motor 6 volt for Boats 2 to 4 Ft. $8.50 value..... 3.88 ☐	10" x 8" x 7"..... 3.98 ☐		
Photo Elec. Cell .98 ☐	Rosin Core Solder, Kesters 3 ounce box.. .50 ☐		Neon Bulbs 15 for 1.00 ☐		
Variable Resistor .50 ☐					

25c ☐ NEW and FULLY REVISED Radio catalogue. Shows parts as low as ½ to ¼ the price you normally pay. Also gives more details, more photos etc. of our kits.....25c. **25c** ☐

MODELLERS—Check off each item you wish to order above. PRINT YOUR NAME AND ADDRESS on a separate sheet of paper with above order. Send REMITTANCE IN FULL.

RADIOMODELS, BOX 36, DEPT. M BALTIMORE 6, MARYLAND

MAN at Work

(*Continued from page 2*)

for rest periods—this span increased to two hours. At first, harder models were fed to the more talented, but after a while it became obvious that in nearly every case, age was all that mattered. Boys of the same age group are almost equally able to make planes.

"The kits were standard ones," Rassbach goes on, "and from the second kit on, all were printed sheet type kits. No pre-fabrication was allowed. After a while, it was easy, with the other boys' help, to move the interest of a prospective modeler from plastic planes to the kits on hand. The kits were Comet models — much airplane for little money." Here's the breakdown: first plane, 10¢ Struct-O-Speed; second, 25¢ stick (built-up) Taylorcraft; third, 50¢ Sparky (good built-up model on which enough is learned so that a boy usually builds two, the second being of contest quality); fourth, any of the dollar line, usually Taylorcraft or the Clipper Jr.

"I claim," Rassbach asserts, "that any kid who builds a good Sparky can build a good anything, except a Wakefield. The group is consistently expanding and soon should be self-perpetuating. Think what would happen if the model builders got behind the Boys' Clubs and pushed. I believe that the better organization and finances of the club present a new approach to the question of continued interest in model planes."

* * *

▸ Why form a club? Why join a club? Within two and a half months of their initial meeting, the Lakewood Flite-Masters (15118 Detroit Ave., Lakewood, Ohio) sent shock waves flying in all directions. In the short period of time, membership jumped to 47 and a seven-point program was carried out, at least four of which would have occupied some clubs for five years. The City of Lakewood not only gave, but actually dedicated, a three-circle U-control field—and for modelers only! A flying circus was established to entertain at industrial picnics and other civic functions. Tentative schedule set up with local Board of Education to include classes in model building and flying in summer school program. A wing ding of a free flight contest is set for June 19, at Strongville Airport, biggest private field in state of Ohio (it sez here). Space doesn't let us plug contests, but support these guys. Twenty-seven trophies plus loot.

And a chance for you Clevelanders to fight for another good flying site. The Flite-Masters pointed out to City Council that a practice ball diamond would serve more people if given over to model planes. Council said, okay, it's yours on trial; prove it will be used sufficiently and properly and, maybe next year, will put in five 70-ft. circles, two black top, two clay, one grass, plus three Half-A circles. Parking lot, fencing, etc. Flying is by permit only. Cleveland metropolitan area fliers welcome—get on the ball by contacting Don Cowgill, above club and address.

* * *

▸ Remember Pete Chinn's Internationalist (MAN, May, '53), a .15-powered FAI job? Well, from Lyman Armstrong, Yuba City, Calif., a wonderful tale of what one man can do with another's design. It all began when Frank Hauser scaled up the ship for a .29. So successful was the big job that Frank had to blueprint his plans for fellow modelers. Frank dubbed this powerhouse the Nationalist. By now it features a lowered pylon and a single tail, instead of twin fins. They have made the thing in all sizes, such as the Communist, 190 sq. in., for Half-A's (not well liked, hence the name!); the Socialist, 509 sq. in. for .15's to .19's; the Nationalist, 640 for .23's to .32's; and the

(*Continued on page 46*)

Flash News

Many developments push back the air frontier -- this monthly report will keep you in the know.

By JOHN F. RUDY

The Army is turning to the air! That may well be aviation's most important news this year -- even though not talked about too openly. The Generals are feeling it may be the only way to surmount the heavy manpower cuts and still carry out successful logistics. Immediate goal is an airlift capable of picking up and moving at least four combat divisions and all equipment. Air Force could hardly do this now for one full division. Some off-the-record talks credit this shortage to American inability to do more in Indo-China.

"Firstest with the mostest" still dominates tactical thinking. The Army doesn't want its own air arm as much as it does mobility. This means ultimate integration of planes into every Army unit, from the squad up. Tactical nuclear weapons will demand faster dispersion. 'Copters will be the cavalry and reconnaissance agents now supplied by the tank.

The day of big supply dumps appears over. Few if any supplies will be allowed in front lines, except those imperative to day-to-day operations. Air can deliver daily. Columns will thus be relieved of extra equipment. One third the number of aircraft could do the job now done by trucks.

Army starts using two new planes this year. About 75 to 100 de Havilland DHC-3 Otters, each carrying 14 fully equipped infantrymen and ammunition, operating from runways 1,000 ft. long and less, will get a thorough tryout. Also, some 10 or so T-37A jet powered observation planes will adjust fire for the big guided missiles, rockets and atomic cannon.

Naval aviation developments will soon be coming into more news prominence. Lightweight attack bombers, vertical take-off interceptors, flying boats at speed of sound, are all in prototype stages. Still other craft with Mach 2 speeds (long range bomber) are almost off the drawing boards.

The whole concept of naval aviation is being rebuilt around the tactics of nuclear assault. On top of this, Navy races its missile program with the Convair Terrier (surface-to-air, Mach 2, 20-mile range), Chance Vought Regulus (surface-to-surface with nuclear warhead that can be used from subs), and the Sperry Sparrow (air-to-air, Mach 2, five-mile range) weapons.

Ejecting a pilot safely from a speeding plane at virtual ground level is being developed in England by Baker-Martin Co., which pioneered seat ejection in 1945. Weight is light compared with present seats, about 60 lb. Device is fitted to Hawker Hunter and Gloster Javelin. At ground level a pilot can pull a cord. This explodes a cartridge that jettisons the plastic canopy over the cockpit and shoots the pilot in his seat upward 80 ft. clear of the plane's tail. Small miniature 'chutes slow down, steady the seat. The harness and seat fall away. A main 'chute opens and pilot floats down. Sounds complex, but tests have shown excellent results.

"The ghost flies well" could be descriptive of the new system for remote control of jet fighters on special drone missions, pilotless intercept or nuclear tests. Listen to these unbelievables:

Automatic take-offs and landings with split second control at all times during climbs, cruise, orbiting or almost any aerial maneuver. If all control signals should be cut while the drone is airborne, the unbelievable does occur. Below pre-selected altitude, the plane's electronic brain takes over, begins a full power climb of exactly 7°; retracts dive flaps if extended; at 200 mph changes to a climbing turn to the left until proper altitude is reached, then engages altitude control and continues a left-turn orbit at 265 mph until signal is restored to guide plane back for normal landing. Air Force and Sperry take the bows!

Airline plane developments are just as spectacular in their way as those for the armed services, even though they don't grab the headlines. Here are the latest innovations: Big, new wingtip tanks will soon go on Constellations being used by five international lines. The pods will boost gas capacity by 1,200 gallons, distance up to 4,620 miles with reserves and 5,850 miles absolute. Other valuable features of tip tanks are improved stability in flight by serving as a "fence" to keep air from spilling off wing end. Strange but true, the tank develops a lift effect strong enough to pay for its own (cont. on page 38)

LIVE WIRE "CHAMPION"

IT'S NEW! - R/C SCALE!

Patterned after the ever popular "Aeronca Champion", designed to give the best in R/C performance, here is the model you have wanted! With full scale appearance it's simple to build and easy to fly just as a R/C model should be! Fly it "rudder only" or use elevators and engine control too, complete information is given!

A SENSATIONAL KIT!

- Removable R/C unit for ease of service!
- 2 big full size detailed plans with instructions!
- Complete control installation information!
- Premium grade balsa and hard maple parts!
- Precisely machined and sharply die cut parts!
- All necessary hardware!
- R/C Bellcrank and horn!
- Formed dural gear!

MODEL'S SPECIFICATIONS!

Wing span: 56"
Wing area: 600 sq. in.
Bare model weight: 30 oz.
Flying weight: 3 to 5 lbs.
Power: .15 to .19 engines

A product of
deBolt Model Engineering
Williamsville, N.Y.

THE VERY FINEST FOR RADIO CONTROL

$6.95

THE "TRAINER" .08-15 ENG
THE WORLD'S MOST POPULAR R/C MODEL!

"LIVE WIRE"

The name that signifies the PROVEN BEST for all R/C flying.

Only with Live Wire Models do you get all of the Superior design Features!

NEW!

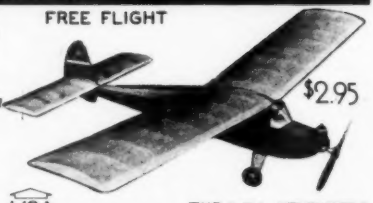
LIVE WIRE "Cruiser"

dmeco's NEW REALISTIC RADIO CONTROL MODEL!

Typical of the Live Wire models is the Cruiser. Its well balanced design provides extremely realistic flight with fine aerobatic precision and good weight carrying ability. Construction is simple and rugged. Exclusive is the removable R/C unit. Live Wire kits are complete with finest All materials, precision finished ready for assembly. Plans are full size and include instructions for building, radio installation and flying. All necessary hardware is given including R/C bellcranks and horn.

$3.95

THE "KITTEN" R/C



FREE FLIGHT

$2.95

1/2A

THE "CLIPPER"

$14.95

THE "SENIOR" 19-23 ENG CUSTOM BUILT

AMERICA'S FINEST COMPETITION MODELS

FOR .19 TO .29 ENGINES

dmeco's *Continental*
FULL STUNT MODEL

AN OUTSTANDING KIT . . . .

$6.95

Now

A SEMI-SCALE AIR RACER
WITH TOP STUNT PERFORMANCE
A FINE SUPER DELUXE KIT.
PLUS DMECO'S FAMOUS QUALITY!

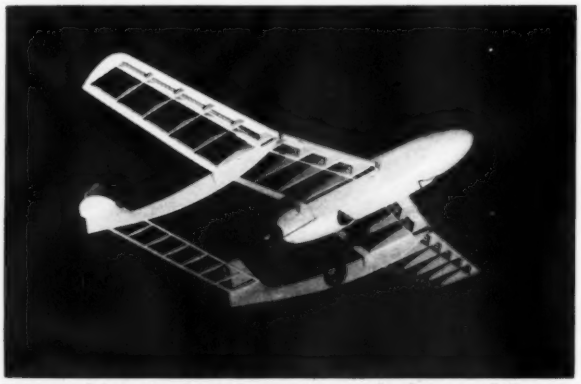
10 YEARS OF PROGRESS BUILT INTO ONE DESIGN!

Ask your Dealer to show you any "dmeco" Model today!

DE BOLT MODEL ENGINEERING CO.

WILLIAMSVILLE "HOME OF DESIGN-ENGINEERED MODELS" NEW YORK USA

Graceful as a bird, on the ground or in the air, the Boomer flies beautifully on the Cox (revs both directions) or the clockwise Holland Wasp.



Light, careful construction is important on pusher because of the rearward location of the engine. Nose is ballasted—but follow directions.

BOOMER

Gem of a free flight has everything: modern design, good looks, sound construction, real flying ability. It's a crowd stopper, believe us, for we've seen it perk. Ever see Half-A as nice as this one?

▼

By BOB MILLER

▶ Pusher models are one of the most neglected types, yet few builders realize just how much fun has been missed if they fail to give them a try. Our first series began with the excellent Arden motors on ignition and these models turned in hours of pleasant, trouble-free flying. Incidentally, one of them is in good flying condition after five years and still has its original prop. This last item is one of the great virtues of the pusher, as one rarely breaks a prop.

In the past I have noted one particular disadvantage of the pusher as viewed by most builders, the lack of pusher or so called "left hand" props. It was with this thought in mind that the Thermal-Hopper was chosen as the powerplant, because of its reed intake valve which will allow right or left hand rotation. This motor, when used in pusher application, is run in the clockwise direction with a standard right hand prop. Another Half-A motor, which can be used after it has been converted to clockwise rotation, is in the Holland Wasp. A clockwise ported crank shaft is available and, once installed, the Wasp can be run clockwise with standard props. The builder having neither of these two engines should not hesitate to carve his own left handed prop.

Let me make this point before interest is lost. I for one will buy the good props available today in preference to carving my own but, if necessary, I will carve a special one. As stated before, pushers rarely break props and the prospect of having to carve only one should not be too frightening. It isn't too difficult: merely take a standard prop, such as a Tornado 6-3, trace its blade shape and check its thickness from hub to tip and cut your own blank. Just remember to carve it with the pitch opposite to the standard one.

Since this is not a step-by-step construction article, only the important points will be discussed. Since the motor is placed behind the CG, care must be taken during construction to keep the tail structure as light as possible. Final balance of the model is achieved by adding lead to the nose. Regular fuel tanks do not function too well when used in pushers because the pick-up

pipe is situated for tractor installation. The coil of plastic fuel line as shown on the plan is wound around a solid balsa core and is held in place by thread and cement. An external tank supplies the fuel for starting and is detached prior to launching. About 12 in. of line will run the motor 30 to 45 seconds and, with the slow climb obtained with a prop on backwards, realistic sport flights can be made.

Choice of wood is very important in the well balanced model. Slant it for the job to be done. All spars, leading and trailing edge stock should be hard. Blocks can be soft, while rib and sheet sides are medium weight. For the booms, select medium weight wood with a definite grain for maximum strength. Do not be tempted to use soft grainless wood for this application because, upon forward impact, weak booms are likely to snap.

Trexler balloon wheels were used on the rear because of their extreme lightness, whereas a fairly heavy aluminum hub-sponge wheel helped add weight to the front where needed. The front strut should be 3/32 in. dia. wire because of the landing load imposed by the model's weight.

Construction of the wing, fuselage pod and elevator is standard. Note the double elevator ribs as the rudder position both top and bottom. The spacing is 1/8 in. to allow the booms to slip off and on while the top side accepts the rudders which are cemented in place after the elevator has been covered.

If the booms stump you, here is the answer. They start as a point, progress to a triangular cross-section and gradually diminish to a flat section at the rear. If possible, cut four boom sides simultaneously. A jig saw is useful. Then cut them individually, being careful to make them accurately. Follow this assembly procedure: apply cement to the edges of B-1 and pin boom sides, one on each side till they come to the front point. Cement B-2 in place under B-1. Quickly run a seam of cement along the bottom inside edges and up the back. Join the two boom sides at the rear and proceed to close up the bottom seam by using pieces of Scotch tape or pins. Avoid introducing a bow into the boom as straightness is important to proper trim of the finished model.

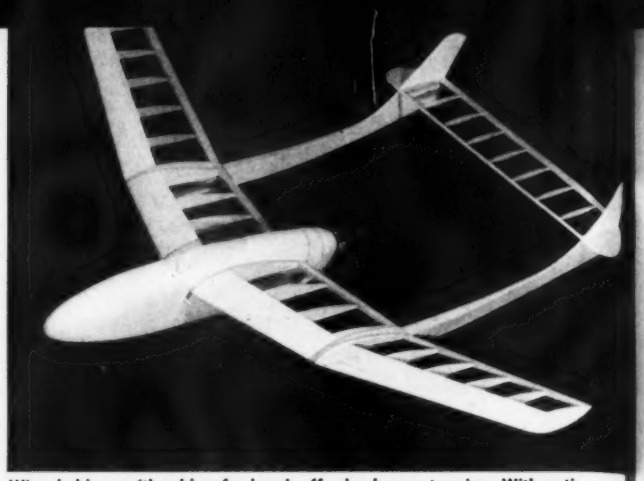
Insert B-3, B-4 and B-5. Then cap the top of the boom with 1/16 in. sheet. The front end of the cap should match the angle of sweep back of the trailing edge of the wing. This last step can best be performed while the boom is temporarily attached to the wing.

Since the model features rugged construction, a suitably strong covering job is in order. The original model was covered with Berkeley SGM Silkspan, which isn't exactly light. Lightweight silk can also be used, as the weight will be less than that of the SGM. The wood surfaces, including the booms, should be covered too, as this will greatly increase their strength.

Give the model three coats of clear fuelproof dope followed with two coats of color and then the final trim. A pair of reference lines drawn in ink on the bottom of the wing center section will aid in lining up the wing to the fuselage pod for consistent assembly. The original model required 2 oz. of lead in its nose to balance and the final weight was 14 oz. Check the model for warps and proceed to test glide it. The best balance for proper trim is between ribs 7 and 8 at the leading edge. Check the angular difference between wing and elevator and, if model appears to stall, reduce the negative angle of the elevator slightly or add a bit more weight to the nose.

It has been observed that these pushers are not particularly affected by torque and we allow them to fly in the circle they create. In the past we have experienced right power and glide circles in one job, yet another flew best in the opposite circle. For power testing, the prop should be put on backward to reduce thrust. After adjustments have been made, it can be turned around for maximum thrust. Under high power it may be necessary to introduce a slight amount of side thrust to eliminate any stall which might occur. Once properly adjusted, the builder will have a model which is a pleasure to fly and the lack of broken props will be a new and pleasant experience.

END

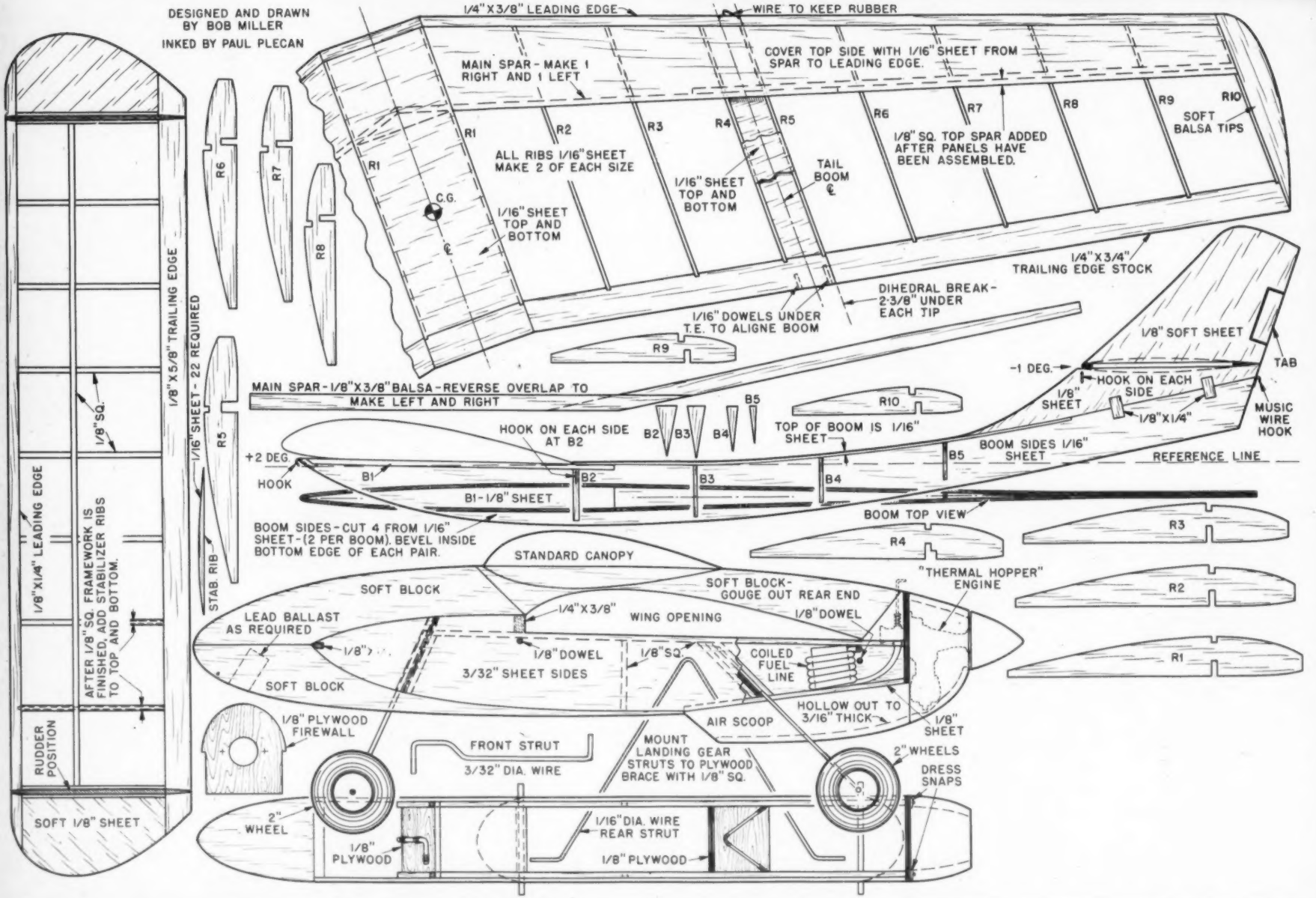


Wing held on with rubber for knock-off, also booms to wing. With anti-clockwise engines, trace outline of correct size prop, carve opposite.

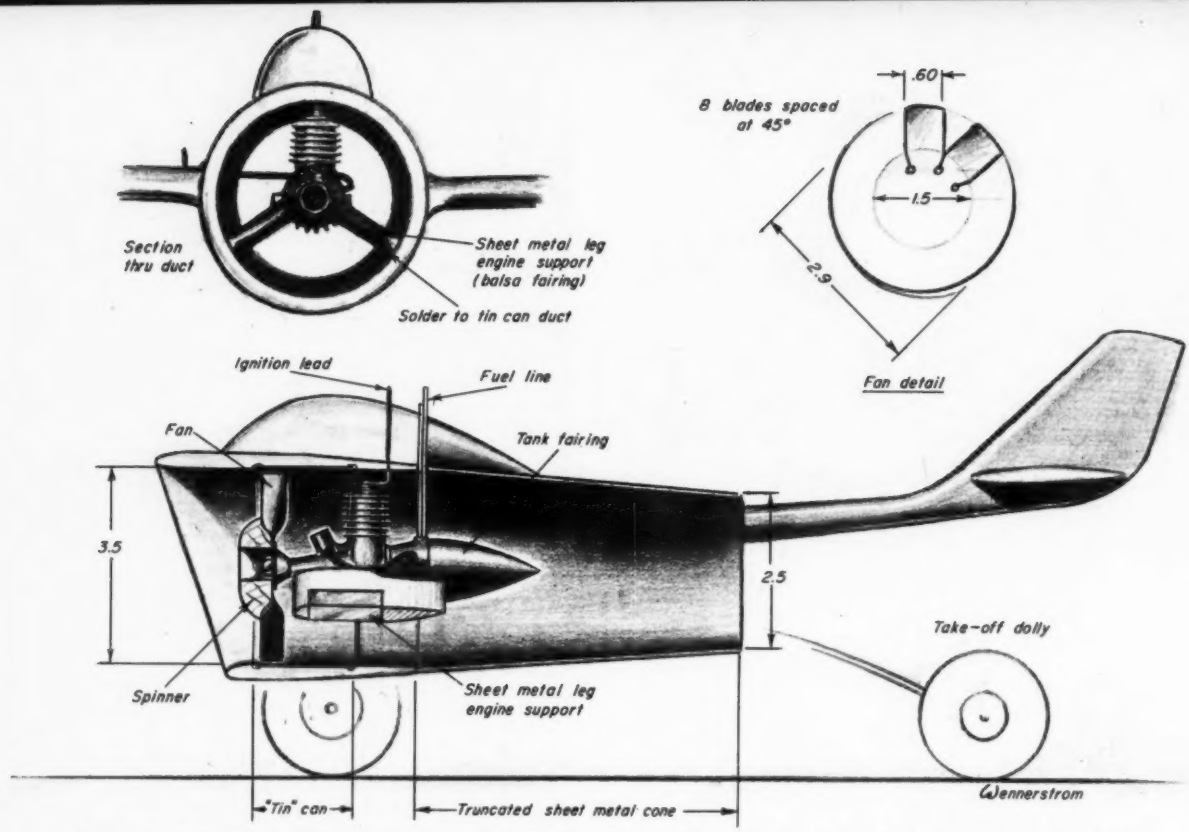
Coiled neoprene tubing makes good timer tank suitable for pusher operation. Ordinary tanks, having pick-up tube wrong end, are not suitable.

Inverted Cox; note air tunnel for cooling, front end of which shows in picture on page 9. Two dress snaps make cowl removal lead pipe cinch.

If this view of Boomer looks familiar, it probably is because you've sketched dream ships like it so many times. Turn that dream into reality!



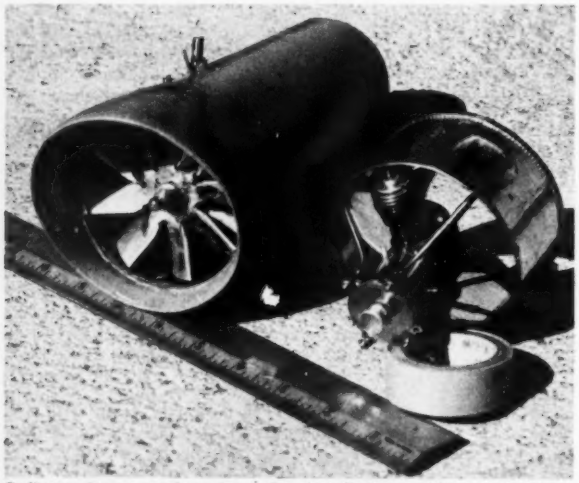
FULL SIZE PLANS AVAILABLE. SEE PAGE 48.



This one sketch shows how to lay out a canned duct for use on either controlline or flying scale free flight, power to match, of course.

the Canned DUCT

By ROBERT T. DeVAULT



Ordinary tin can used for Space Bug installation is still recognizable in right hand pic. Finished canned duct, left, reveals sheet metal fan.

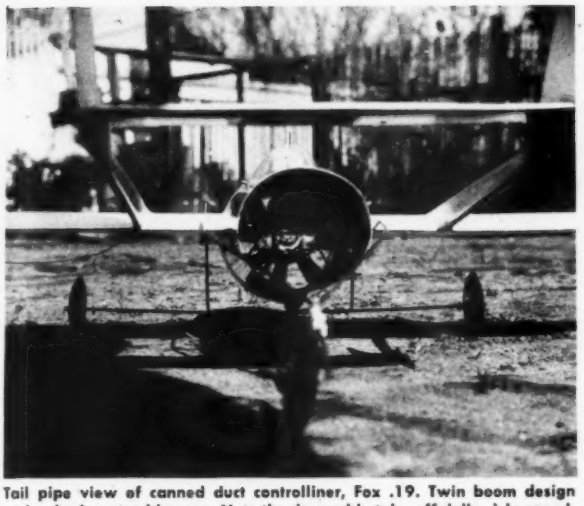
Climaxing a great series of articles on reaction propulsion, the author details his finding in efficient ducted fans for free flight and, get this, controlline. With this data you should be able to build and fly either type of model. Why not now?

▶ Actually, the can had chicken in it. But it was exactly the right size, so I bought it. The problem of getting a light, rigid and round ring for duct models is a nasty one, but fortunately American Industry has come to the rescue with a tin can.

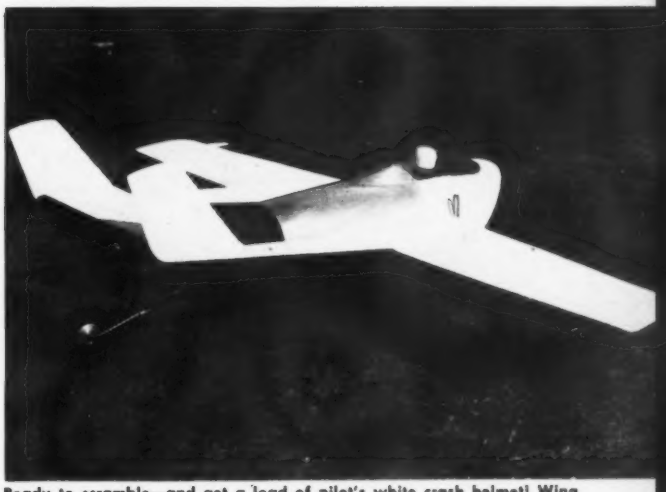
Ducted fans depend on small gaps between the fan tip and the duct for high efficiency. The duct must be round and rigid, therefore, and the engine must be tied rigidly to the ring around the fan. Half-A engines can be held in place largely by cement, if the engine surface is cleaned well (with a detergent soap, for instance). Then the motor mount legs can be cemented to brackets which in turn are soldered to the ring, giving a clean, rigid mount, if done carefully.

The power package described here can be used to power free flight or light controlline models. It will produce up to 6 oz. of thrust and should fly a 12 oz. model in free flight. The fan in our test free flight model was made of wood, the blades being laboriously carved and sanded and then glued into a turned hub. At the request of your editor, we decided to offer a simpler fan, of just as good performance.

Previous fans have been of the "flower petal" type (see Purcell's Sabre in MAN for Sept. 1953). This type is of basically low efficiency. The twist comes out the wrong way and the blade tips are too wide. After some thought and experimentation we have come up with the one-piece metal fan shown in the drawing. This fan is of high efficiency design and, by experimenting a little with the amount of twist and the tip blade angle, you can bring the thrust to a peak for your particular model and engine. We must insert a word of caution here. The stresses in the blade roots should be considered. If you use steel, the root stresses will be around 5,000 lb. per sq. in. at 18,000 rpm. (The thickness of the material used makes no difference to the stress.) Using aluminum will cut the stress by a factor of 3, however, since aluminum is one-third as heavy as steel. An alloy of good ductility is recommended,



Tail pipe view of canned duct controlliner, Fox .19. Twin boom design makes body assembly easy. Note the droppable take-off dolly, à la speed.



Ready to scramble—and get a load of pilot's white crash helmet! Wing does not pass through fuselage—pushrod is inside the left-hand tail boom.

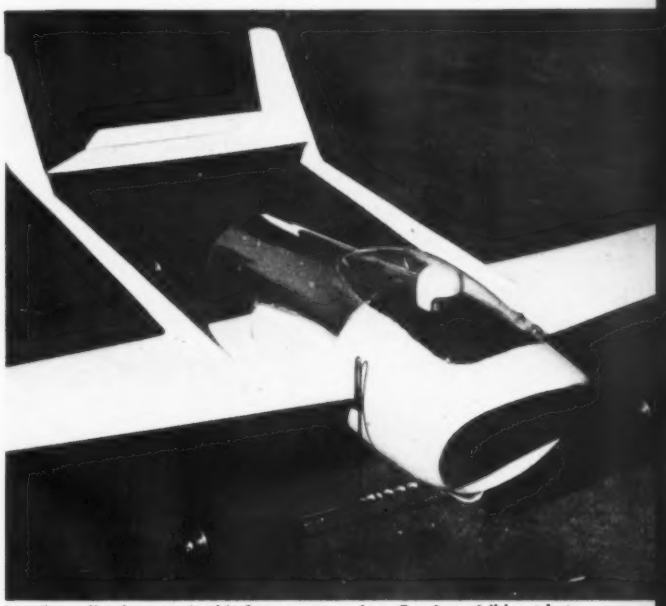
like 24S. The stress at 18,000 rpm will then be reduced to 1,600 psi, while the ultimate strength of 24SO is 26,000 psi, giving a good safety factor. The rpm will average around 15,000, for most engines, so the average safety factor will be around 20. We tested two blade samples made of .064 24SO with the 45° twist at the root and obtained a 490 lb. breaking load on the weakest. The load at 15,000 rpm for this blade would be 17 lb.; and at 18,000 rpm, 24 lb., so the design is quite satisfactory.

Do not run the fan outside of its ring. This unloads the engine, allowing it to overspeed, and makes anybody in the plane of the fan a likely target for a defective blade. Also, avoid bending the blades back and forth and be careful when setting the twist, or small cracks will develop at the root which will seriously weaken the blade.

Our canned duct unit has been reduced to utmost simplicity to get you interested in ducted fans of good performance. Much can be done to improve its appearance and to fit it into scale models, but it is a good idea to obtain experience with a new device in its simplest form.

The same design principles can be used to build larger units, also. But remember, a 4-in. fan will have about 1.8 times the stress at the same rpm, or the same stress at 75 per cent of the rpm for the 3-in. unit.

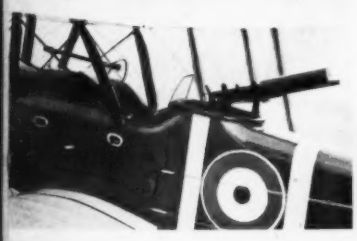
Now, then, after eating the canned chicken, make up the U-shaped motor mount leg brackets from sheet metal from another can, and solder them firmly in place, about 120° apart. Drill a hole in the center of the bottom of the can for the prop shaft, and use this to locate the engine while fastening it in place. Cut 1/4 in. balsa to fit the leg brackets and engine and cement in place, using a strong, fuelproof cement. Shape the leading edges of the legs so that they will act as airfoils, straightening out the swirl (which is in the direction of fan rotation). Cut out the bottom of the can, remove from prop shaft, and finish cementing around the front of the engine. Allow plenty of time for the cement to set. It's very frustrating to have the engine come loose after the duct is all assembled. The inlet can be made from two layers of soft 1/8 in. balsa for convenience. The inlet has been left large for good low-speed performance and easy hand-cranking. Fairly thick lips are needed, since part of the thrust comes from the pressures around the lips. The tailcone is made from a light fiberboard, such as used in filing folders. The fan proper is made from .040 to .064-in. thick 24SO aluminum, or any fairly ductile metal. A clearance of 1/32 is recommended around the blade tips, though a little more won't hurt. Lay out the fan accurately and cut it out as precisely (*Continued on page* 42)



Details really show up in this front quarter view. Fan just visible at bottom of shark-like mouth. Wing ties in with fuselage front bulkheads.

Below—Free flight features high wing location, V-tail. Since air speed through duct is very high, interior must be smooth, clean, as is shown.

Colorful in more ways than one, the RE-8 is resplendent: khaki fuselage, yellow wings and stab, silver wheel discs, red-white-blue markings.



How's this for detail? The flippers work on scale, outside horn.

the RE-8

By FRANK W. BEATTY

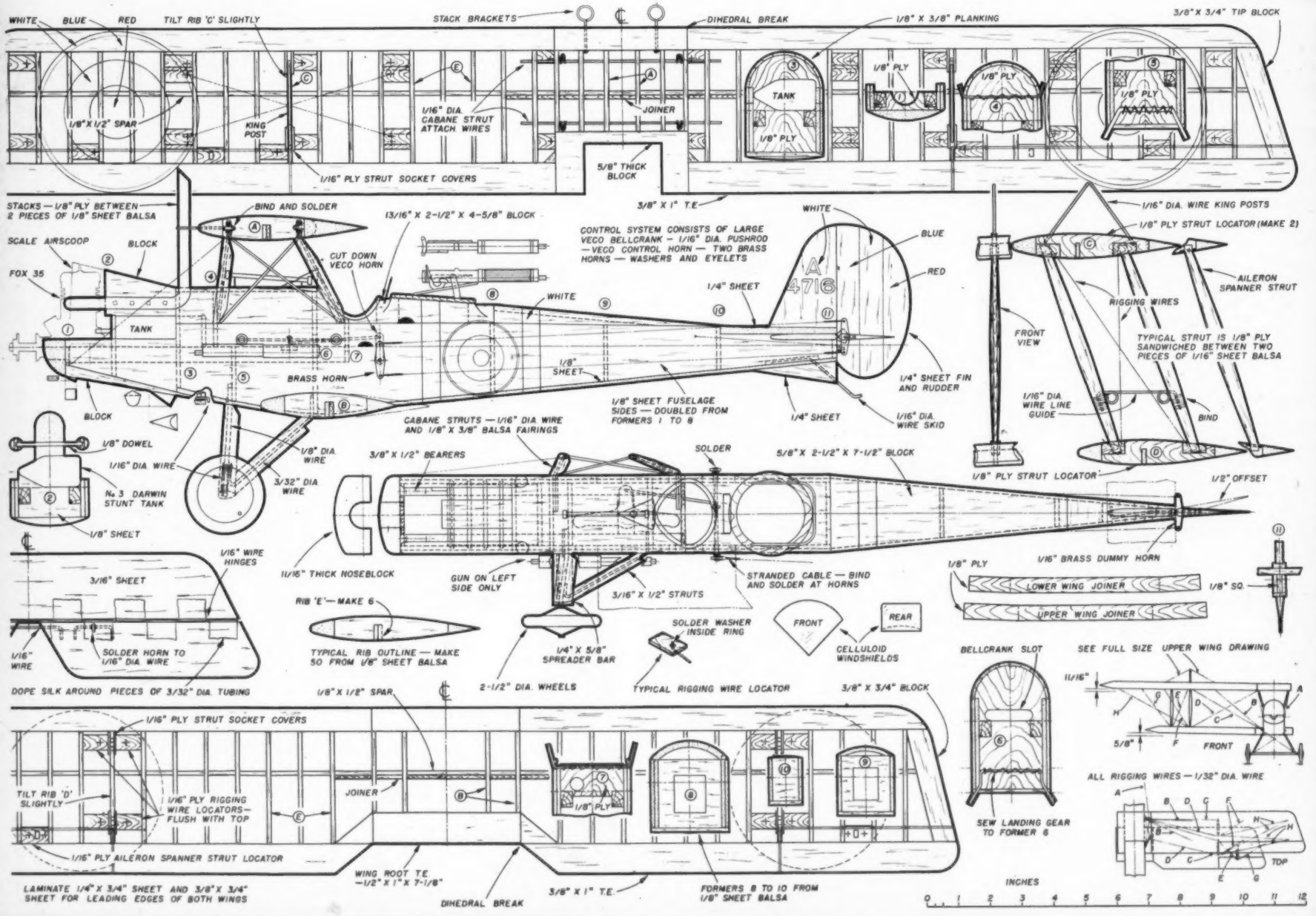
One of the famous crates of World War I, the British RE-8. For .29-.35 engines, it's put together by loving hands, wires and all. It can be stunted.

I have always been an admirer of World War I biplanes. I've built many of them as controlline scale models even though as a group a large percentage of them cannot be built to give anything but an erratic disappointing performance in the air. The RE-8 was the result of a long search for a World War I type bipe whose design would adapt itself readily to fine controlline flying. A brief analysis of the drawings shows the ship has a smallish, slim fuselage compared with the amount of wing area. For control there is ample tail area. But, best of all, the wings are set well back on the fuselage for good trim characteristics. Note also that the wheels are set forward of the CG for good landings.

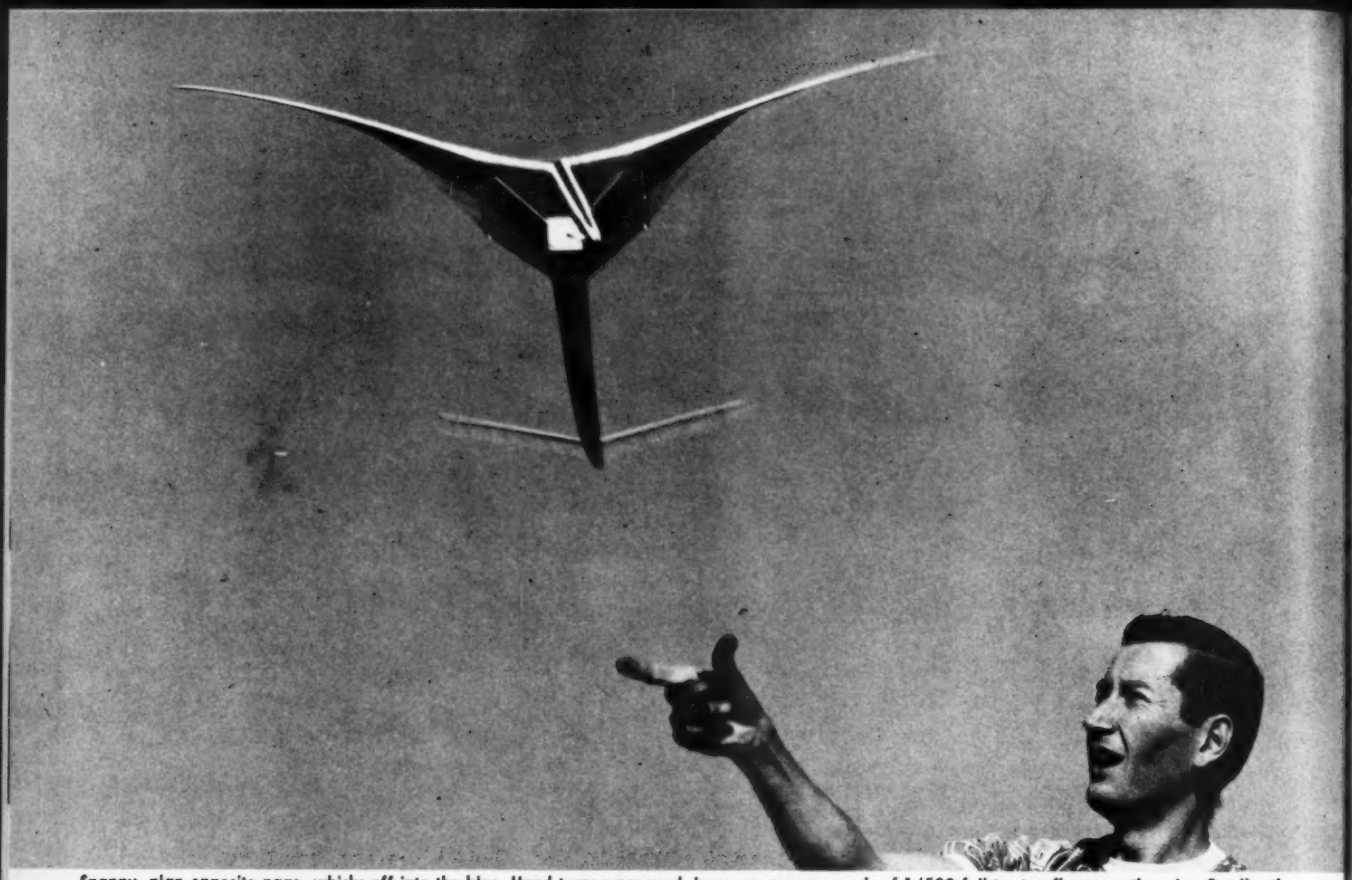
This Fox-powered, 34 oz. ship lifts easily off the ground and can do wingovers, loops and inverted flight. The daredevil expert could really wring this one out. This is one scale model which is a pleasure to land. The low wing loading and drag of the rigging makes for a really long, slow glide. The ship touches down easily and almost never noses over.

This colorful, detailed, ruggedly (*Continued on page 36*)

Our RE-8 could also appeal to full-rigged ship fans! Jobs like this inspired the famous birdcage story—if the bird got out, a wire had to be broken.


WHITE
BLUE
RED
TILT RIB 'C' SLIGHTLY
STACK BRACKETS
DIHEDRAL BREAK
1/8" X 3/8" PLANKING
3/8" X 3/4" TIP BLOCK
1/8" X 1/2" SPAR
KING POST
1/16" DIA CABANE STRUT ATTACH WIRES
JOINER
TANK
1/8" PLY
1/16" PLY STRUT SOCKET COVERS
5/8" THICK BLOCK
3/8" X 1" T.E.
STACKS — 1/8" PLY BETWEEN 2 PIECES OF 1/8" SHEET BALSA
BIND AND SOLDER
13/16" X 2-1/2" X 4-5/8" BLOCK
SCALE AIRSCOOP
BLOCK
FOX 35
CUT DOWN VECO HORN
CONTROL SYSTEM CONSISTS OF LARGE VECO BELLCRANK — 1/16" DIA. PUSHROD — VECO CONTROL HORN — TWO BRASS HORNS — WASHERS AND EYELETS
1/4" SHEET
BRASS HORN
1/8" SHEET
1/8" SHEET FUSELAGE SIDES — DOUBLED FROM FORMERS 1 TO 8
1/4" SHEET FIN AND RUDDER
1/16" DIA. WIRE SKID
CABANE STRUTS — 1/16" DIA WIRE AND 1/8" X 3/8" BALSA FAIRINGS
1/8" DOWEL
1/16" DIA. WIRE
No. 3 DARWIN STUNT TANK
1/8" SHEET
1/8" DIA WIRE
3/32" DIA WIRE
3/8" X 1/2" BEARERS
SOLDER
5/8" X 2-1/2" X 7-1/2" BLOCK
1/2" OFFSET
1/16" WIRE HINGES
3/16" SHEET
1/16" WIRE
SOLDER HORN TO 1/16" DIA. WIRE
DOPE SILK AROUND PIECES OF 3/32" DIA. TUBING
11/16" THICK NOSEBLOCK
GUN ON LEFT SIDE ONLY
STRANDED CABLE — BIND AND SOLDER AT HORNS
3/16" X 1/2" STRUTS
RIB 'E' — MAKE 6
TYPICAL RIB OUTLINE — MAKE SO FROM 1/8" SHEET BALSA
1/4" X 5/8" SPREADER BAR
2-1/2" DIA. WHEELS
SOLDER WASHER INSIDE RING
TYPICAL RIGGING WIRE LOCATOR
FRONT
REAR
CELLULOID WINDSHIELDS
1/8" PLY
1/16" BRASS DUMMY HORN
LOWER WING JOINER
UPPER WING JOINER
1/8" SQ.
1/16" DIA. WIRE KING POSTS
1/8" PLY STRUT LOCATOR (MAKE 2)
AILERON SPANNER STRUT
RIGGING WIRES
FRONT VIEW
TYPICAL STRUT IS 1/8" PLY SANDWICHED BETWEEN TWO PIECES OF 1/16" SHEET BALSA
1/16" DIA. WIRE LINE GUIDE
BIND
1/8" PLY STRUT LOCATOR
1/8" X 1/2" SPAR
3/8" X 3/4" BLOCK
1/16" PLY STRUT SOCKET COVERS
TILT RIB 'D' SLIGHTLY
1/16" PLY RIGGING WIRE LOCATORS — FLUSH WITH TOP
JOINER
1/8" PLY
1/16" PLY AILERON SPANNER STRUT LOCATOR
WING ROOT T.E. — 1/2" X 1" X 7-1/8"
DIHEDRAL BREAK
3/8" X 1" T.E.
FORMERS 8 TO 10 FROM 1/8" SHEET BALSA
LAMINATE 1/4" X 3/4" SHEET AND 3/8" X 3/4" SHEET FOR LEADING EDGES OF BOTH WINGS
BELLCRANK SLOT
SEW LANDING GEAR TO FORMER 6
SEE FULL SIZE UPPER WING DRAWING
11/16"
5/8"
FRONT
ALL RIGGING WIRES — 1/32" DIA. WIRE
TOP
INCHES
0 1 2 3 4 5 6 7 8 9 10 11 12

FULL SIZE PLANS AVAILABLE. SEE PAGE 48.



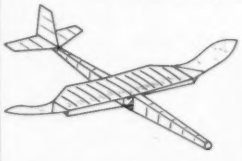
Snappy, plan opposite page, whisks off into the blue. Hand turns were used, because camera speeds of 1/500 fail to stop flappers otherwise. Smaller the flapper, faster the beat. Some outdoor flappers of 20-inch span sound like pack of playing cards stuck in a fan, climb to match. Ornithopter, correct!

FLAPPING WINGS

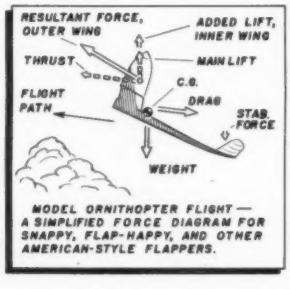
By PARNELL SCHOENKY

Man has learned to fly, but not like the birds. This intriguing discussion includes info and a plan to build your own flapper.

DESIGN VARIATIONS IN FLAPPING WING MODELS

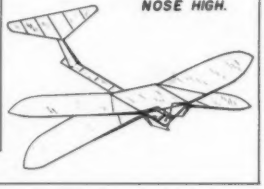


ONE OF MANY SUCCESSFUL DESIGNS BY DR. LIPPISCH AND COLLEAGUES, THIS MODEL DERIVES ITS LIFT FROM A FIXED WING, PROPULSION FROM THE FLAPPING TIPS. FLIES WELL, BUT IS NOT A TRUE ORNITHOPTER. THE RUBBER MOTOR IS IN TWO SECTIONS.



MODEL ORNITHOPTER FLIGHT — A SIMPLIFIED FORCE DIAGRAM FOR SNAPPY, FLAP-HAPPY, AND OTHER AMERICAN-STYLE FLAPPERS.

THIS UNIQUE MULTI-WING ORNITHOPTER BY J.S. WHITE ESTABLISHED A NEW BRITISH RECORD OF 115 SECONDS. THE STAGGERED-PHASE FLAPPERS PROVIDE A SMOOTH SOURCE OF LIFT AND THRUST. FLIES WITH NOSE HIGH.

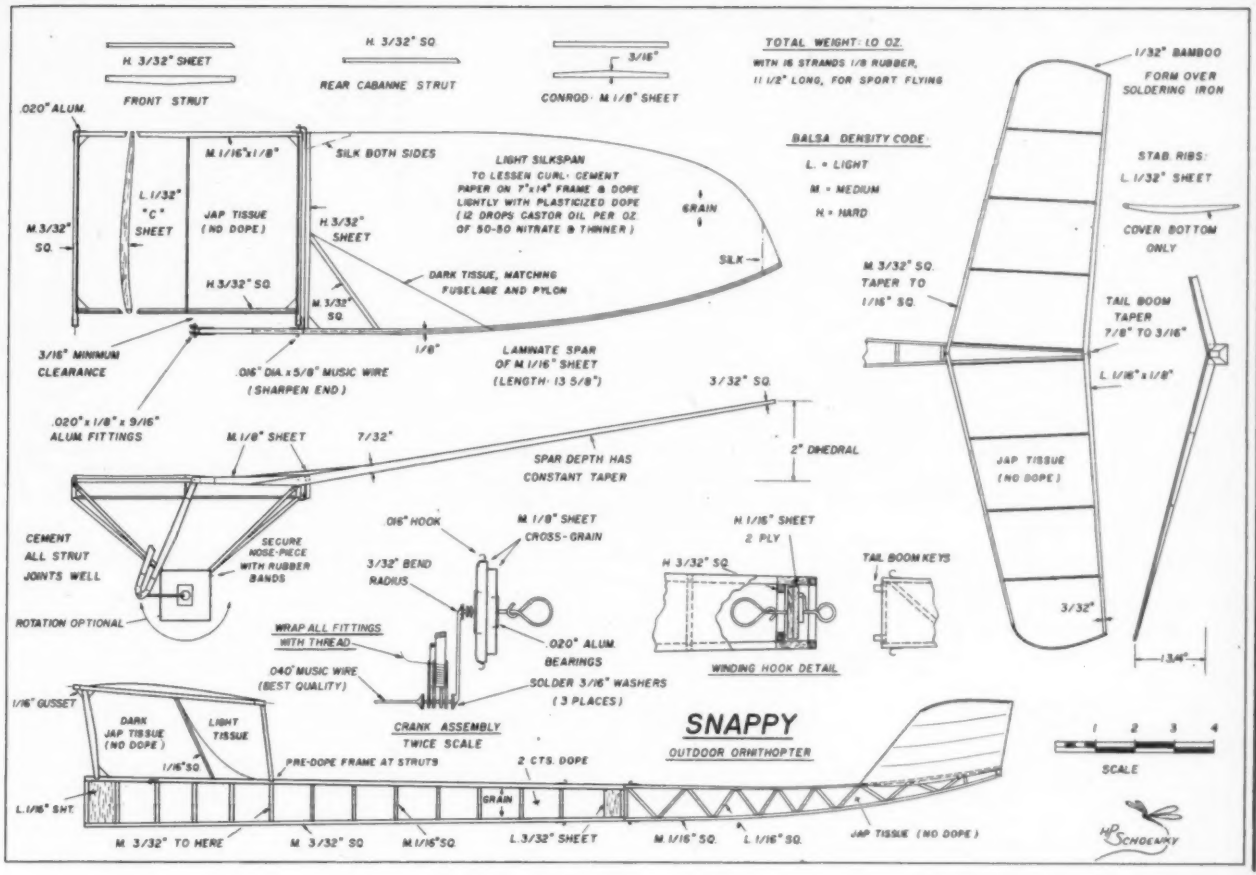


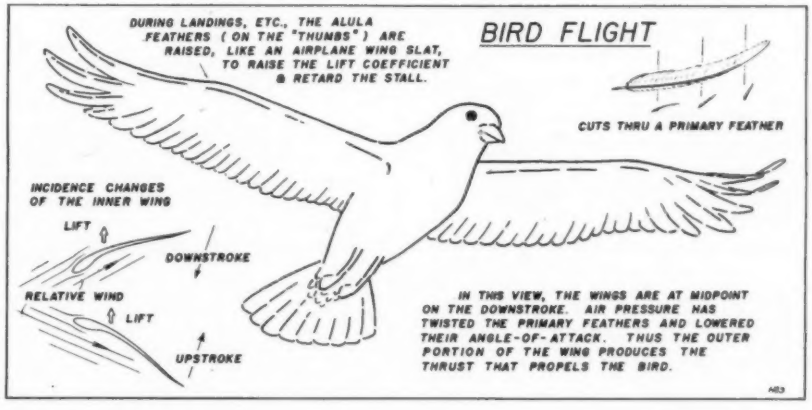
Today most types of model aircraft are so highly developed that the would-be experimenter has little opportunity to tackle the unknown or to learn the taste of accomplishment that spurred on the Wrights and Sikorskys of the model world: Cecil Peoli, Maxwell Bassett, Grant, Goldberg, Walker and all the many others. But much remains to be done in the field of unorthodox aircraft and in this series we are going to take up two of the most challenging types, flapping-wing and rotary-wing craft, and present successful flying models in each category.

"Ornithopters," so our dictionary states, "are flying machines sustained and propelled by an upward and downward movement of the wings, as in the flight of a bird." The family of flapping-wing craft includes ornithopters, entomopters and, for want of a better term, what we might call flapper-propelled models. In this article the emphasis will be placed on the ornithopters, for which recognized AMA events have long existed.

First let us preview the model detailed in this article. "Snappy," we call her, and true to her name she's a lively performer. If your flying field is the nearest baseball diamond or a quiet corner of the Municipal Park, build Snappy as a sport model. Pack in some turns with the handy front crank, launch her gently and away she'll go. A quick climb, followed by steady circles and a dead-stick landing are characteristic of this model. Should your interests be competitive, Snappy still has what it takes. The usual rubber model techniques concerning light, sturdy construction and the proper handling of rubber motors, when applied to Snappy, will put her up with the best.

Ornithopters being rather uncommon, as models go, something more than a few paragraphs on the construction of Snappy are called for. How an ornithopter flies, and how the birds whose flight it strives to duplicate actually do fly, are essential to know if one would improve upon this design. And in addition, a brief review of past flapping-wing projects will lend perspective to our present efforts.



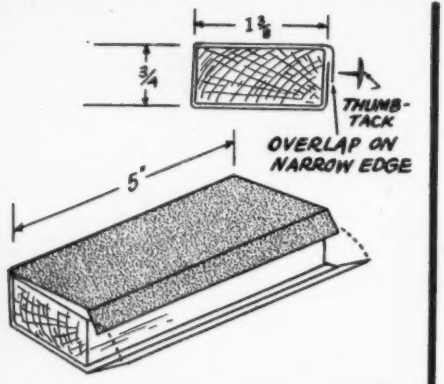

BIRD FLIGHT
DURING LANDINGS, ETC., THE ALULA FEATHERS (ON THE "THUMBS") ARE RAISED, LIKE AN AIRPLANE WING SLAT, TO RAISE THE LIFT COEFFICIENT & RETARD THE STALL.
CUTS THRU A PRIMARY FEATHER
INCIDENCE CHANGES OF THE INNER WING
LIFT
DOWNSTROKE
RELATIVE WIND
LIFT
UPSTROKE
IN THIS VIEW, THE WINGS ARE AT MIDPOINT ON THE DOWNSTROKE. AIR PRESSURE HAS TWISTED THE PRIMARY FEATHERS AND LOWERED THEIR ANGLE-OF-ATTACK. THUS THE OUTER PORTION OF THE WING PRODUCES THE THRUST THAT PROPELS THE BIRD.

Flap Happy 11, author's 1946 model, had about 500 flights by 1949, when this shot was taken.

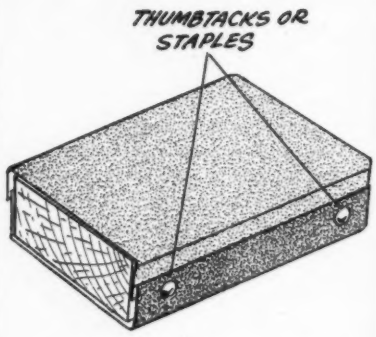
Bird Flight

Everyone has observed literally thousands of birds on the wing, yet very few people have an accurate knowledge of the mechanics of bird flight. With the aid of high-speed photography and much patient observation, researchers have acquired a good understanding of how many birds manipulate their wings and tail in the course of flight. Though many of the aerodynamic subtleties remain undiscovered, the available knowledge is sufficient to be of great assistance to us in the design of ornithopters.

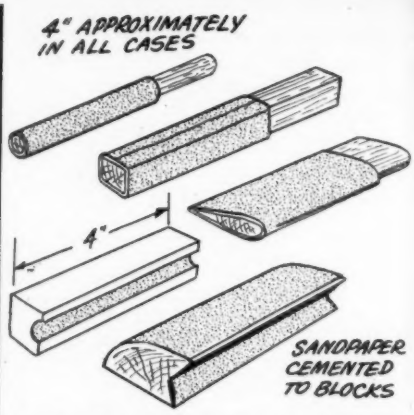
When birds are in full flight, their entire wings move up and down through an arc that may vary from about 60 to as much as 180°. The moving wing provides both lift and propulsion at the same time, and on both the up and down strokes. In order to accomplish this dual function, the construction of a typical wing varies considerably from the shoulder to the tip. This structural and functional variation with span is most evident on the larger birds. We might classify birds into two general types: (a) short-range birds, such as the sparrow, and (b) long-range, high efficiency birds, such as the albatross and the wild goose. Form follows function and so the sparrow, whose needs are rapid take-offs and maneuverability, is provided with fast-beating wings of short span and deep chord. The heavier birds, particularly those which normally range far out over the sea, must employ higher aspect ratios. A bird's inner wing section has feathers that essentially lay fore and aft and, together with small contour feathers, form an efficient cambered airfoil section. The outer section of the wing consists of feathers which fan out so that the extreme tip or primary feathers lie perpendicular to the direction of flight. During dynamic flight these primary feathers spread apart and twist increasingly along their length, in response (*Continued on page 39*)



TO GET MAXIMUM USE FROM 4½"X5" "HANDY-PAK" SANDPAPER SHEETS, USE A SOFT PINE BLOCK MEASURING 5" LONG X 1⅜" WIDE X ¾" THICK. OVERLAP SANDPAPER AT ONE EDGE & HOLD IN PLACE WITH STAPLES OR THUMBTACK.

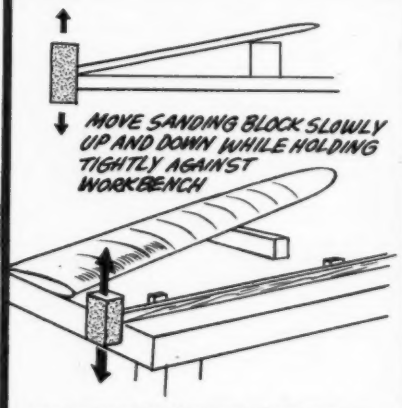


A HANDY BLOCK TO HAVE AROUND IS ONE WITH PAPERS OF DIFFERENT GRADES. MEDIUM ON ONE SIDE, AND FINE ON THE OTHER OR ANY DESIRED COMBINATION.

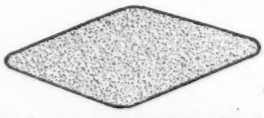


THE SANDING STICKS SHOWN & THE TWO SPECIAL APPLICATION BLOCKS ARE THE HANDIEST "TOOLS ON THE WORKBENCH. COUNTLESS VARIATIONS ARE POSSIBLE....

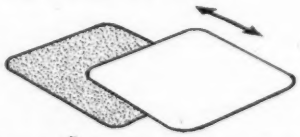
TO SAND LARGE SURFACES LIKE COWL BLOCKS PERFECTLY FLAT, THE METHOD SHOWN ABOVE IS HARD TO BEAT...



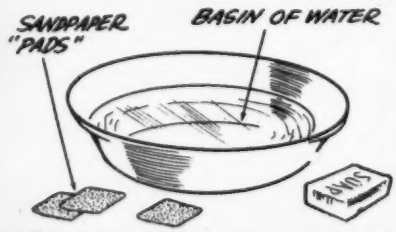
AN EXCELLENT SCHEME FOR SQUARING SPAR ENDS OR BEVELING JOINTS, ETC. SANDING BLOCK SHOULD BE HELD SQUARELY AGAINST END OF BENCH —



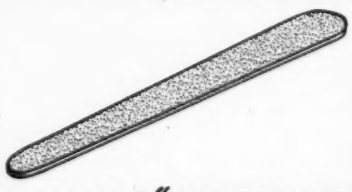
SMALL SANDPAPER SQUARES SHOULD HAVE ALL CORNERS ROUNDED TO PREVENT GOUGING & TEARING. NEVER USE A GOOD PAIR OF SCISSORS TO CUT SANDPAPER.



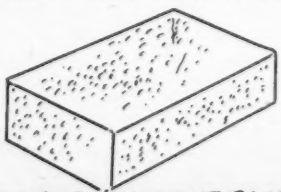
TO GET EXTREMELY "FINE SANDPAPER FOR FINAL FINISHING, RUB THE FACES OF TWO EXTRA FINE PIECES TOGETHER —



WET SANDING IS "SUREFIRE" FOR SUPER FINISHING. USE "WETORDRY PAPERS. A LITTLE SOAP ADDED TO THE WATER IS RECOMMENDED. THE SOAPY WATER ACTS AS A LUBRICANT TO KEEP THE GRIT FROM BECOMING CLOGGED WITH FINISH PARTICLES. BEFORE WET SANDING, BE SURE ALL PORES ARE CLOSED WITH SEALER...

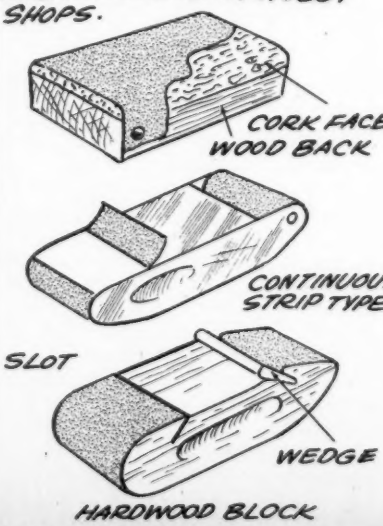


SO CALLED "EMERY BOARDS" INTENDED AS NAIL FILES MAKE EXCELLENT SANDING STICKS FOR NOTCHING ETC.



FOAMED STYRENE PLASTIC BLOCK WITH ABRASIVE MAKES AN EXCELLENT SANDING BLOCK....

USEFUL SANDING BLOCKS ARE AVAILABLE AT HOBBY SHOPS.

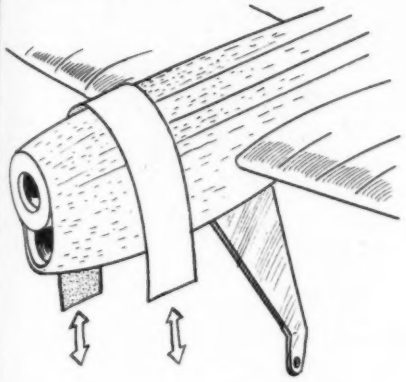


Sandpaper

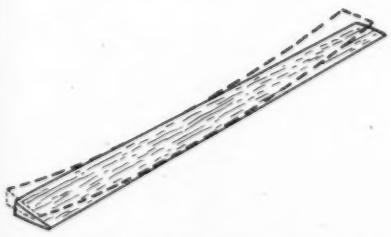
By H. A. WILLIAMSON

Directions always seem to say: now sand this. But what does the designer really mean? With what kind of paper? How? So here's a refresher in one of the ABC's good for all.

CROSSGRAIN SANDING WITH ½" TO 1" WIDE STRIP IS GOOD FOR ROUGH SANDING OF PLANKED FUSELAGES



HAND SANDING OF BALSA WITHOUT A BLOCK SHOULD BE DONE CAUTIOUSLY. "POINT OF PRESSURE" OF FINGERS CAN PRODUCE IRREGULAR SURFACE. BEST USE IS IN FINE FINISH SANDING.



EXCESSIVE SANDING ON ONE SIDE OF THIN BALSA STRIPS MAY PRODUCE SERIOUS WARPS BY DISPLACING THE WOOD FIBERS. IF CONSIDERABLE SANDING IS REQUIRED, BALANCED CUTS SHOULD BE USED (ALTERNATE SIDES) TO ELIMINATE THIS TROUBLE.

In at least one respect, the builder of model airplanes is a fortunate fellow, for he has chosen the hobby which provides the maximum in thrills and enjoyment for a minimum investment for tools and special equipment. Only a few of the most basic hand tools plus razor blades and sandpaper can, in skilled hands, produce the very finest models.

Regardless of the number and variety of tools and complex equipment an individual may have, however, the workhorse of his shop is—*sandpaper!* The knowledge of how best to use this material is a prerequisite for every serious modeler. One might almost say, "The difference between a model and a contest winner is—*sandpaper!*"

Sandpaper (abrasive paper is actually a more accurate title) is obtainable in a wide variety of grades, generally classified according to the grit or wire mesh size. These classifications are commonly represented by indicating the relative "fineness" of the abrasive particles used. For instance, a No. 1 paper has a specific grit size or "fineness" and 8/0 (280 mesh) yet another "fineness."

The numbering systems used to grade abrasive papers are sometimes slightly confusing to even the most experienced modelers. So, rather than get into a somewhat tedious and time-consuming discussion that would be of questionable value, we suggest that you refer to the accompanying table for the suggested grades for common modeling applications. It might also be helpful to point out that buying abrasive paper from the local hobby shop or hardware store may usually be simplified by merely asking for coarse, medium, fine or extra fine grades, since there seems to be a trend toward this less complex classification system by some manufacturers.

As we pointed out several paragraphs ago, sandpaper is actually a misnomer, because of the variety of abrasive materials in common use today. Some of these materials are: tempered garnet, aluminum oxide, flint, crushed quartz (sand), silicon carbide, emery, etc. All of these abrasive materials are extremely hard and function like little chisels, to shave off tiny particles of the material being worked on. Generally speaking, the garnet, silicon carbide and flint papers are the most effective for use on balsa and the other common modeling woods.

Both Kraft paper and cotton cloth (Jeans and Drills) of varying weights are used for backing materials. The cloth-backed abrasives are much more costly and are intended primarily for metal working and power sanding applications.

Some of the finer grades of abrasive paper are water-resistant, having the grit cemented to a waterproof paper, using a waterproof glue. It goes without saying, therefore, that these may safely be used for final finishing operations that dictate the need for wet sanding. Papers of this type are obtainable under the tradename "Wetordry."

Abrasive papers are available in several common sheet sizes: the 9 x 11 in. single sheets of specific grades and the 4-1/2 x 5 in. "Handy-Paks" of assorted grades and abrasive materials. In addition, rolls and discs and various assorted pre-formed shapes of paper and cloth are available, to suit any conceivable requirement.

Good hand-sanding techniques are acquired only by experience! The realization by the modeler that sandpaper is the most versatile "tool" he has, plus experience, provides the key to near perfection in the end product—the model! END

Mesh No.	Grit Size	General Grouping	Modeling Application
12—4-1/2 to 36—2		Very Coarse	Not for modeling large size of abrasive particles. Tears soft woods.
40—1-1/2 to 60—1/2		Coarse	Use with care on plywood and very hard balsa for very rough sanding.
80—1/0 to 120—3/0		Medium	For most rough sanding applications on blocks, planked fuselages, etc.
150—4/0 to 220—6/0		Fine	For most sheet balsa rough sanding jobs, tail surfaces, ribs, sides, etc.
240—7/0 to *400—10/0		Very Fine	Final finishing of all surfaces. "Wetordry" for finishing sealed and painted surfaces in this range.

*600 mesh papers (extremely fine) are available from some manufacturers.

Bit of everything in this line-up of jobs by the Seattle Radio Aero Club. How many do you know?

Radio Control NEWS

By E. J. LORENZ

Things happening too fast for you? Pulse or not to pulse? One channel, three, five? Calm down and do your catching up here each month. News.

▸ After receiving a few letters requesting "debugging" information on our MOPA transmitter and inquiring about a particular receiver problem, we are offering a few remedies. The transmitter consists of an oscillator and amplifier. Many builders say that the oscillator works fine until they put the chassis in the case or attach the antenna. Chances are that the oscillator section is "peaked" too high, thus throwing it out of oscillation when a load, such as tuning the amplifier, attaching an antenna, etc., is placed upon it. The remedy is to adjust the oscillator until it is working properly as per the instructions, then *back off toward minimum capacity* on the trimmer. This will not produce full output but it will make for stable operation. When the chassis is in the case and the antenna is attached and the amplifier tuned, as per our text of August, 1954, then the oscillator section can be tuned a little more sharply. This will increase the output but care must be taken not to get it so sharp as to knock it out of oscillation when the transmitter is keyed.

We've heard that some installations are wired so as to keep the oscillator on all of the time, then keying the amplifier to send out the signal. This might work well as long as your receiver is not too sensitive. However, a sensitive receiver will pick up the power from the oscillator, which filters through the "dead" amplifier section. Insensitivity of the two-tube circuit (receiver) can usually be traced to differences in the RK-61 tubes. At the present time, it is possible to obtain three different "types" of RK-61 tubes. In order to overcome the insensitivity problem, it is necessary to decrease the quench frequency. This will also help to increase not only the sensitivity but also the selectivity. The remedy in this case is to increase the value of the grid leak resistor between 2.7 and 3.9 megs to 4.7 megs and increase the grid leak capacitor from 100 mmf to 120 mmf. Ten per cent tolerance components should be used. Either or both resistor and capacitor may be changed to obtain optimum results. Also, be sure that the mounting rings on the coil form do not touch the coil windings.

Fig. 1 shows the method of attaching the rudder and elevator linkages on the Babcock Super Compound Escapement. The rudder linkage is quite conventional but the elevator linkage is a bit on the novel side. The first set of instructions with the Babcock escapement showed only a photograph of the unit. We hope this will give a little more detail. The elevator itself is stopped in a neutral position and is allowed to move only in an "up" direction. It should be *lightly* spring loaded to return to neutral. As the crank throw on the escapement wheel approaches the third position, the linkage is deflected and will remain so until the neutral position of the escapement is reached. Preliminary tests with this unit have been very good and we predict many more unusual hook-ups when it reaches the field in volume.

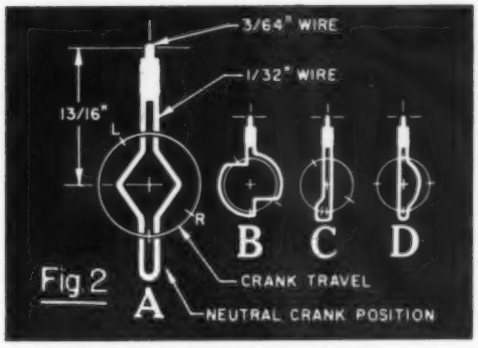
You should have a guilty feeling if you haven't sent in your FCC registration yet. New Zealand has 27 and 35 mc and we could, too, if there were enough registrations on file with the FCC.

Now with the hot weather upon us, the best way to get top performance out of your batteries is to keep them in a cool dry place when not in use. Keep your plane or boat out of the hot sun when not in use. Heat and low humidity will knock down a battery almost as fast as overuse. It is true, however, that a cell is slightly rejuvenated by the application of moderate heat, but this is a temporary condition.

We've had several very interesting letters from Frank Dazey, 332 Via Pasqual, Redondo Beach, Calif. Fig. 2 elaborates on some escapement yokes and gives an idea of how to get more out of "plain escapement." "A" was developed by Howard Bonner to prevent overtravel. It also operates with less resistance and makes for a stronger control system. "B" is used by Dick Schumacher to eliminate rudder overtravel and permit the rudder to be in neutral on the third position. "C" provides for neutral rudder on the third position and "D" is for an elevator operating, single escapement. It provides for more movement in one position than the other. Small return springs of thin piano wire must be used on "B" and "C" to return the rudder to neutral. The yokes may be made from 1/32 in. wire, carefully bent to shape and then soldered to the 3/64 in. torque rod. These yokes were made for the Bonner compound which stops at 57° for the first stop, 212° for the second stop, 350 for the third stop and then 10° to neutral.

To plot a particular yoke, draw a circle to represent the crank travel—about .310 in. radius for the Bonner. Mark the stop positions on this circle, as given in degrees above. Mark the torque rod centerline on the drawing and then fasten this sketch to the board. Draw your special yoke design on tracing paper, putting in the torque rod centerline. Place the yoke drawing over the first sketch and put a thumbtack or pin through the two torque rod centerlines, which must coincide. By pivoting the yoke drawing, the exact control movement can be seen as the yoke follows the crank through the various stopping places. This should be quite helpful to all fliers in getting unusual control movements. Frank also mentions that Webb Hill took first place at the Los Angeles Radio Controllers' contest back in January by pulling a proto take-off. This consists of taxiing out, stopping and then proceeding to take off. All of this was done by using a compound escapement on the rudder and engine control. The engine was adjusted to hit low speed about one second after release, allowing the head wind to stop the model and then hitting high speed again for take-off. Which proves that wheel brakes aren't needed to get fancy results.

Fig. 3 shows a "B" battery charger by L. R. Purdy of Smyrna,



Left—DMECO Aeronca. Above—Newest Silvercel. Right—Linkage tricks, drawn Frank Dazey; see article.

Ga. This set-up will allow you to get more life out of the small hearing aid batteries. Just after the last issue was put to bed, Mr. Purdy advised that on the PC tone receiver, resistor part No. 14 may have to be changed to 20 megs instead of the 10 megs as given. Some of the sub-miniature tubes (1AG4, CK526) used for the relay stage may not cut off with the 10 meg resistor.

NEW ITEMS

The new RC scale by the deBolt Model Engineering Co. of Williamsville, N. Y. based on the famous Aeronca design. Suitable for .09 to .15 engines, this 56 in. model is in super de luxe class as far as design and materials are concerned. Selling for $10.95, this plane, known as the Live Wire Champion, will carry 2 lb. of radio gear. Also from this company comes the new model 5PN boat servo. This unit will give selective rudder control, forward, stop and reverse positions for the electric motor drive. Price is $24.95.

Have you sent in your FCC registration yet?

We'd like to make a price correction on the Newx escapement which was written up recently. The price is $7.95 and the Newx Products Co. of Union, N. Y. informs that each escapement is robot tested for reliable and trouble-free operation. These escapements will take up to 300 pulses per minute without skipping or "hanging up." We've installed ours in an Electra and so far have had absolutely no trouble.

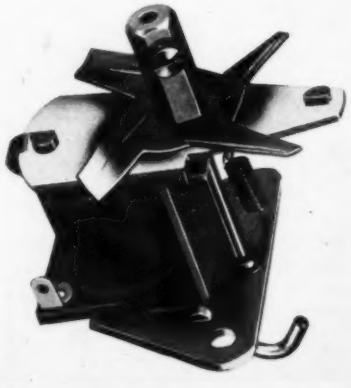
Remember, there are an estimated 50,000 RC builders and fliers in this country, and so far only about 6,500 registrations have been received by the FCC. Where is yours?

Several pieces of German RC equipment are coming into the country now and the photo shows a four-position escapement distributed by the Wilshire Model Center of Santa Monica, Calif. Featuring low battery drain on 3 volts, it is sturdily built with bushings on the main shaft and sells for but $5.95. This is an excellent type of secondary escapement for engine or motor speed control, where the control is to remain in one position until the unit is keyed again.

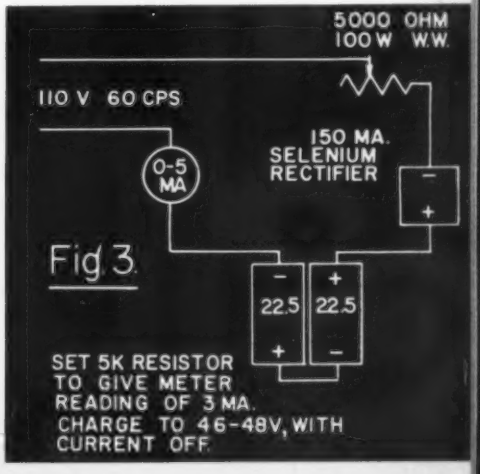
Several months ago this column gave information on a sub-miniature plug and jack by the Telex Co. of St. Paul, Minn. Now, Switchcraft, Inc., 1328-30 N. Halstead St., Chicago, offers, through most radio jobbers, their new Tini-Jax and Tini-Plug. Sub-miniature in size, the jack mounts in a 1/4 in. hole, is Part No. 42-A and sells for 45¢, no more than a regular closed circuit jack. The plug, number 750 (black) or 755 (red), sells for 70¢, is 3/8 in. in diameter and less than 1-5/8 in. long. A real quality item that conserves space and weight and which will give excellent service.

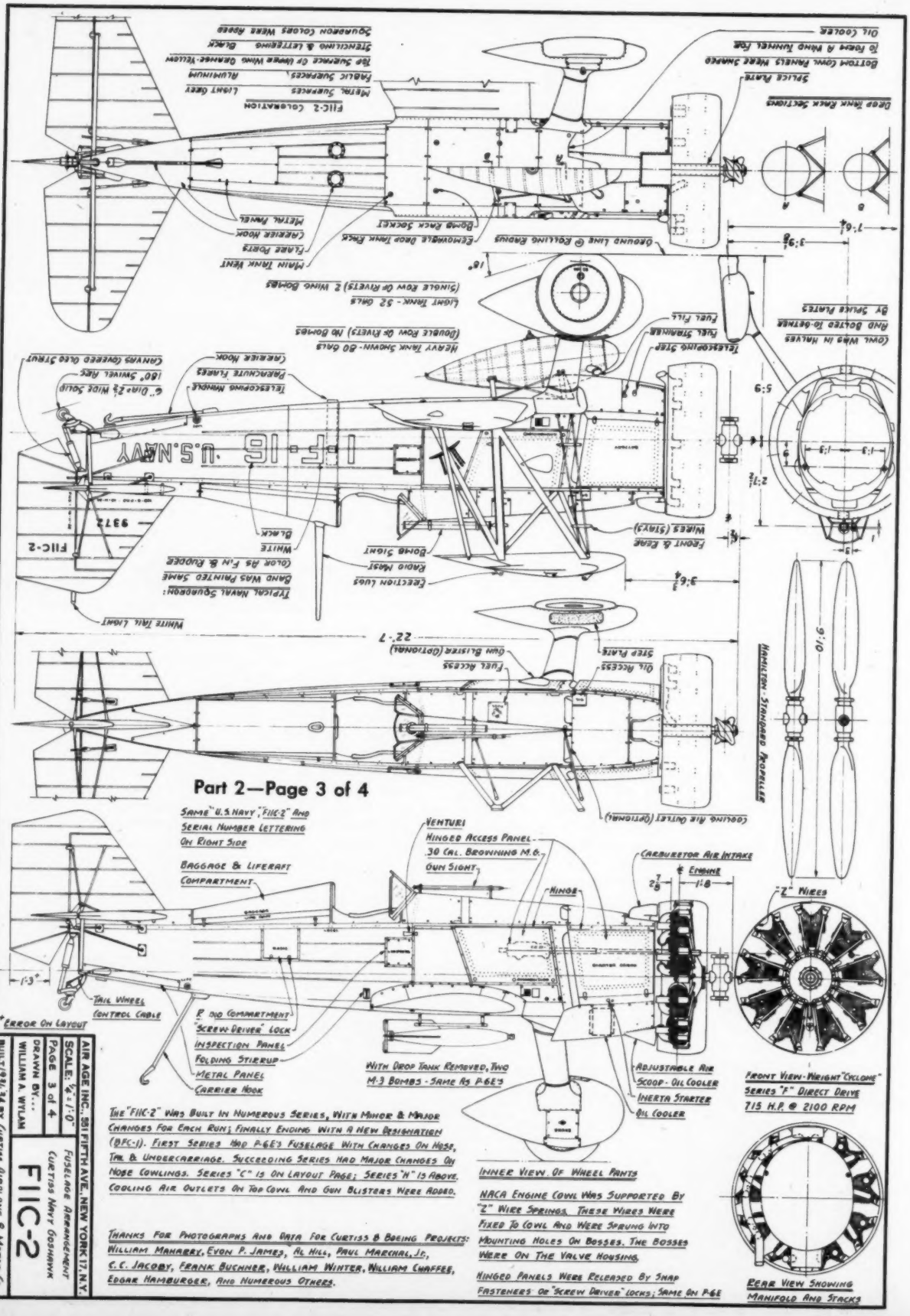
Do you feel financially flush? For about $30 you can buy a sub-miniature Elgine-Neomatic relay, measuring about 3/16 x 3/8 x 1/2 in. and weighing less than 1/16 oz. Sensitivity is 100 milliwatts, with special settings as low as 10 mw. We don't think there will be any great rush on this relay, mainly because of the price, but it shows what can be expected in our field in the next five years. There are many other recent developments in the component field, many of which are either not commercially available or are too costly at present, which prompts us to predict single-channel receivers no larger than a small match box, but complete with relay and batteries. Multi-channel equipment, with relays and batteries, will take up less space than a pack of cigarettes and weigh but a few ounces.

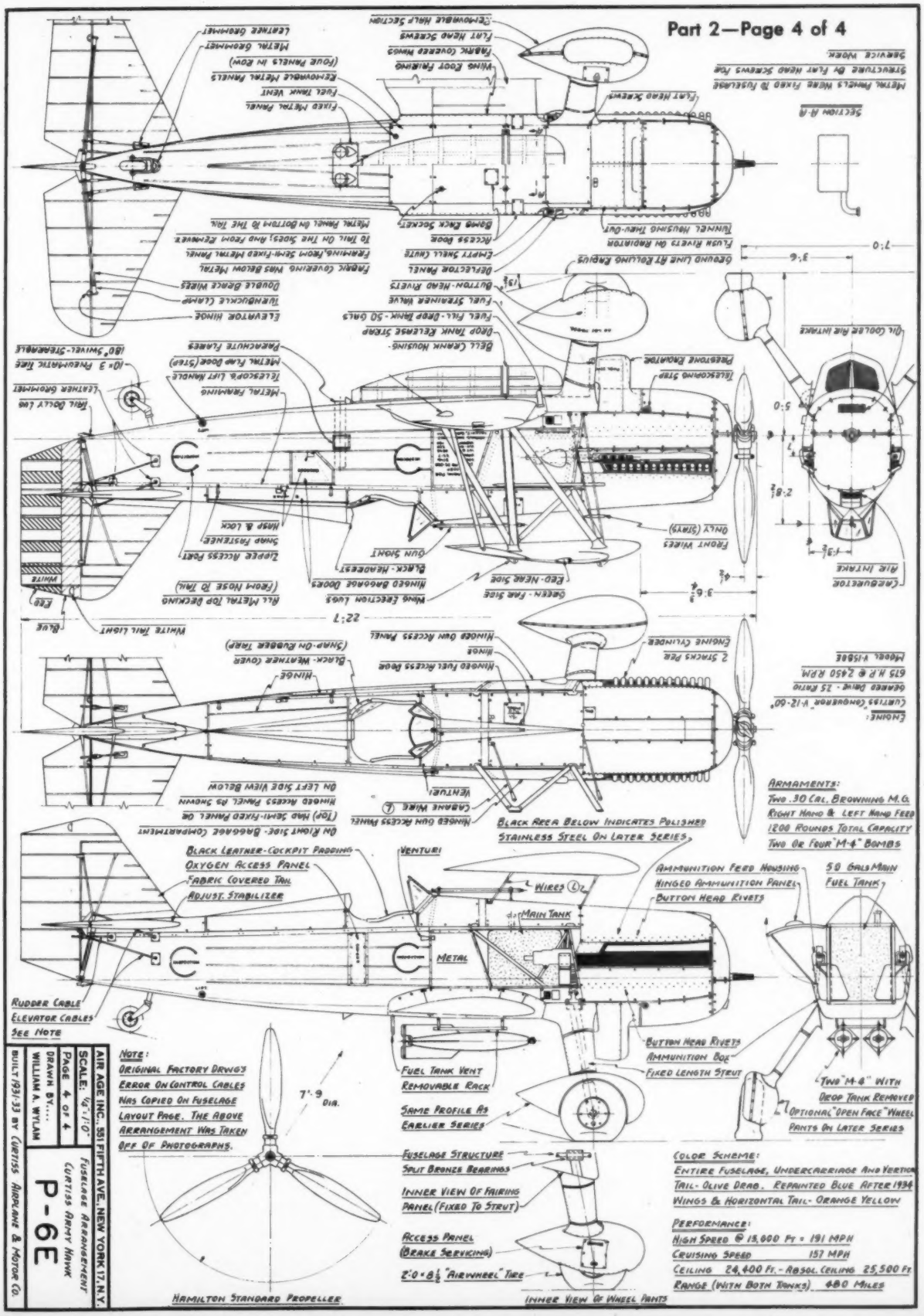
Polk's Model Craft Hobbies, (*Continued on page 50*)



German four-position escapement, imported, Wilshire Model Center. Holds position till keyed.




Part 2—Page 3 of 4
FIIC-2
BUILT 1931-34 BY CURTISS AIRPLANE & MOTOR CO.
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 1/4" = 1'-0"
PAGE 3 of 4
DRAWN BY... WILLIAM A. WYLAM
CURTISS NAVY OSPREY
FUSELAGE ARRANGEMENT
U.S. NAVY
HAMILTON-STANDARD PROPELLER
"Z" WIRES
FRONT VIEW-WRIGHT "CYCLONE" SERIES "F" DIRECT DRIVE 715 H.P. @ 2100 RPM
REAR VIEW SHOWING MANIFOLD AND STACKS
WITH DROP TANK REMOVED, TWO M-3 BOMBS - SAME AS P-6E'S
INNER VIEW OF WHEEL PANTS
NACA ENGINE COWL WAS SUPPORTED BY "Z" WIRE SPRINGS. THESE WIRES WERE FIXED TO COWL AND WERE SPRUNG INTO MOUNTING HOLES ON BOSSES. THE BOSSES WERE ON THE VALVE HOUSING.
HINGED PANELS WERE RELEASED BY SNAP FASTENERS OR "SCREW DRIVER" LOCKS; SAME ON P-6E
THE "FIIC-2" WAS BUILT IN NUMEROUS SERIES, WITH MINOR & MAJOR CHANGES FOR EACH RUN; FINALLY ENDING WITH A NEW DESIGNATION (BFC-1). FIRST SERIES HAD P-6E'S FUSELAGE WITH CHANGES ON NOSE, TAIL & UNDERCARRIAGE. SUCCEEDING SERIES HAD MAJOR CHANGES ON NOSE COWLINGS. SERIES "C" IS ON LAYOUT PAGE; SERIES "H" IS ABOVE. COOLING AIR OUTLETS ON TOP COWL AND GUN BLISTERS WERE ADDED.
THANKS FOR PHOTOGRAPHS AND DATA FOR CURTISS & BOEING PROJECTS: WILLIAM MAHARRY, EVON P. JAMES, AL HILL, PAUL MARCHAL, JR., C.C. JACOBY, FRANK BUCHNER, WILLIAM WINTER, WILLIAM CHAFFEE, EDGAR HAMBURGER, AND NUMEROUS OTHERS.
*ERROR ON LAYOUT
SAME "U.S. NAVY", "FIIC-2" AND SERIAL NUMBER LETTERING ON RIGHT SIDE
BAGGAGE & LIFERAFT COMPARTMENT
TAIL WHEEL CONTROL CABLE
"SCREW-DRIVER" LOCK
INSPECTION PANEL
FOLDING STIRRUP
METAL PANEL
CARRIER HOOK
VENTURI
HINGED ACCESS PANEL
30 CAL. BROWNING M.G.
GUN SIGHT
HINGE
CARBURETOR AIR INTAKE
ENGINE
ADJUSTABLE AIR SCOOP - OIL COOLER
INERTIA STARTER
OIL COOLER
FUEL ACCESS
STEP PLATE
GUN BLISTER (OPTIONAL)
COOLING AIR OUTLET (OPTIONAL)
OIL ACCESS
FRONT & REAR WIRES (TWO)
RADIO MAST
BOMB SIGHT
WHITE
BLACK
TYPICAL NAVAL SQUADRON: BAND WAS PAINTED SAME (COLOR AS F.IN B. FUDGE)
WHITE TAIL LIGHT
RECTION LUGS
TELESCOPING STRUT
FUEL TRAINER
FUEL FILL
(OWL WAS IN HALVES AND BOLTED TOGETHER BY SPLICE PLATES)
DEEP TANK RACK SECTIONS
SPLICE PLATE
BOTTOM COWL PANELS WERE SNAPED TO FORM A WING NUMBER FOR OIL COOLER
FIIC-2 COLORATION
METAL SURFACES, LIGHT GREY
FABRIC SURFACES, ALUMINUM
TOP SURFACE OF UPPER WING ORANGE-YELLOW
STENCILING & LETTERING BLACK
SQUADRON COLORS WERE REED
MAIN TANK VENT
FLARE PORTS
CARRIER HOOK
METAL PROPELLER
BOMB RACK SOCKET
REMOVABLE DROP TANK RACK
GROUND LINE @ ROLLING RADIUS
LIGHT TANK - 52 GALS (SINGLE ROW OF RIVETS) 2 WING BOMBS
HEAVY TANK SHOWN - 80 GALS (DOUBLE ROW OF RIVETS) NO BOMBS
TELESCOPING MEMBER
PARACHUTE FLARES
6" DIA. 2½ WIDE SOLID
180° SWIVEL RES.
CANVAS COVERED OLEO STRUT
9372
22'-7
3:6¾
5:9
2:7½
9'-10
7'-6¼
3'-9⅜
1'-3"
1'-8"
2⅞


P-6E
CURTISS ARMY HAWK
FUSELAGE ARRANGEMENT
BUILT 1931-33 BY CURTISS AIRPLANE & MOTOR CO.
AIR AGE INC. 551 FIFTH AVE. NEW YORK 17, N.Y.
SCALE: 1/4"=1'-0"
PAGE 4 OF 4
DRAWN BY.... WILLIAM A. WYLAM
NOTE: ORIGINAL FACTORY DRWG'S ERROR ON CONTROL CABLES WAS COPIED ON FUSELAGE LAYOUT PAGE. THE ABOVE ARRANGEMENT WAS TAKEN OFF OF PHOTOGRAPHS.
HAMILTON STANDARD PROPELLER
7'-9" DIA.
INNER VIEW OF WHEEL PANTS
ENGINE: CURTISS CONQUEROR V-12-60° GEARED DRIVE - .75 RATIO 675 H.P. @ 2450 R.P.M. MODEL V-1570E
2 SPARKS PER ENGINE CYLINDER
ARMAMENTS: TWO .30 CAL. BROWNING M.G. RIGHT HAND & LEFT HAND FEED 1200 ROUNDS TOTAL CAPACITY TWO OR FOUR "M-4" BOMBS
BLACK AREA BELOW INDICATES POLISHED STAINLESS STEEL ON LATER SERIES
COLOR SCHEME: ENTIRE FUSELAGE, UNDERCARRIAGE AND VERTICAL TAIL - OLIVE DRAB. REPAINTED BLUE AFTER 1934 WINGS & HORIZONTAL TAIL - ORANGE YELLOW
PERFORMANCE:
HIGH SPEED @ 13,000 FT = 191 MPH
CRUISING SPEED 157 MPH
CEILING 24,400 FT. - ABSOL. CEILING 25,500 FT
RANGE (WITH BOTH TANKS) 480 MILES
SECTION A-A
7:0
5:0
2:6½
3:6
22:7
3:6½
½
¾
1½
RUDDER CABLE
ELEVATOR CABLES
SEE NOTE
BLACK LEATHER-COCKPIT PADDING
OXYGEN ACCESS PANEL
FABRIC COVERED TAIL
ADJUST. STABILIZER
METAL
MAIN TANK
VENTURI
WIRES
AMMUNITION FEED HOUSING
HINGED AMMUNITION PANEL
BUTTON HEAD RIVETS
50 GALS MAIN FUEL TANK
BUTTON HEAD RIVETS
AMMUNITION BOX
FIXED LENGTH STRUT
TWO "M-4" WITH DROP TANK REMOVED
OPTIONAL "OPEN FACE" WHEEL PANTS ON LATER SERIES
FUEL TANK VENT
REMOVABLE RACK
SAME PROFILE AS EARLIER SERIES
FUSELAGE STRUCTURE
SPLIT BRONZE BEARINGS
INNER VIEW OF FAIRING PANEL (FIXED TO STRUT)
ACCESS PANEL (BRAKE SERVICING)
2'-0 x 8½" "AIRWHEEL" TIRE
ELEVATOR HINGE
LEATHER GROMMET
METAL GROMMET (FOUR PANELS IN ROW)
REMOVABLE METAL PANELS
FUEL TANK VENT
FIXED METAL PANEL
METAL PANEL ON BOTTOM OF THE TAIL
TO TAIL ON THE SIDES AND FROM REAR
FABRIC COVERING MAIS BELOW METAL
DOUBLE BRACE WIRES
TURNBUCKLE CLAMP
(10" 3 PNEUMATIC TIRE 180° SWIVEL-STEERABLE
PARACHUTE FLARES
METAL FLAP DOOR (STEP)
TELESCOPIC LIFT HANDLE
METAL FRAMING
TAIL SKID LEATHER GROMMET
WHITE
RED
BLUE
WHITE TAIL LIGHT
(FROM NOSE TO TAIL)
ALL METAL TOP DECKING
LEVER ACCESS DOOR
SNAP FASTENER
HASP & LOCK
GUN SIGHT
WING ERECTION LUGS
MINOR DRAGBRACE DOORS
BLACK-HEADREST
RED-NEAR SIDE
GREEN-FAR SIDE
CABANE WIRE
NINGED GUN ACCESS PANEL
VENTURI
ON LEFT SIDE VIEW BELOW
(TOP) HAP SEMI-FIXED PANEL OR HINGED ACCESS PANEL AS SHOWN ON RIGHT SIDE-BRACE COMPARTMENT
(SNAP-ON FUSELAGE TARP)
BLACK-WEATHER COVER
HINGE
HINGED FUEL ACCESS DOOR
HINGE
HINGED GUN ACCESS PANEL
ENGINE
FRONT WIRES ONLY (3 WAYS)
TELESCOPING STRUT
PEDESTONE FAIRING
OIL COOLER AIR INTAKE
(RECTANGULAR) AIR INTAKE
OVERHUNG LINE FIT BOLTING BRACING
FLUSH RIVETS ON RADIATOR TUNNEL HOUSING THEN-OUT
DEFLECTOR PANEL
EMPTY SHELL CHUTE
ACCESS DOOR
BOMB RACK SECRET
METAL PANEL ON BOTTOM TO THE TAIL
FABRIC COVERING MAIS BELOW METAL
FAIRING, FROM SEMI-FIXED METAL PANEL
TO TAIL ON THE SIDES AND FROM REAR
BELL CRANK HOUSING
DROP TANK RELEASE STRAP
FUEL FILL - DROP TANK - 50 GALS
FUEL STREAMER WAVE
BUTTON-HEAD RIVETS
WING FOOT FAIRING
FAIRING COVERED MAIS
FLAT HEAD SCREWS
REMOVABLE HALF SECTION
FLAT HEAD SCREWS
METAL PANELS MADE FIXED TO FUSELAGE STRUCTURE BY FLAT HEAD SCREWS FOR SERVICE WORK

Though the photographer caught the bipe with test K & B in place, drawings show the later Cub .049A with ukie tank. Go-goes on small Kaysun prop.

Barnstormer Bipe . . . .

by William Mack

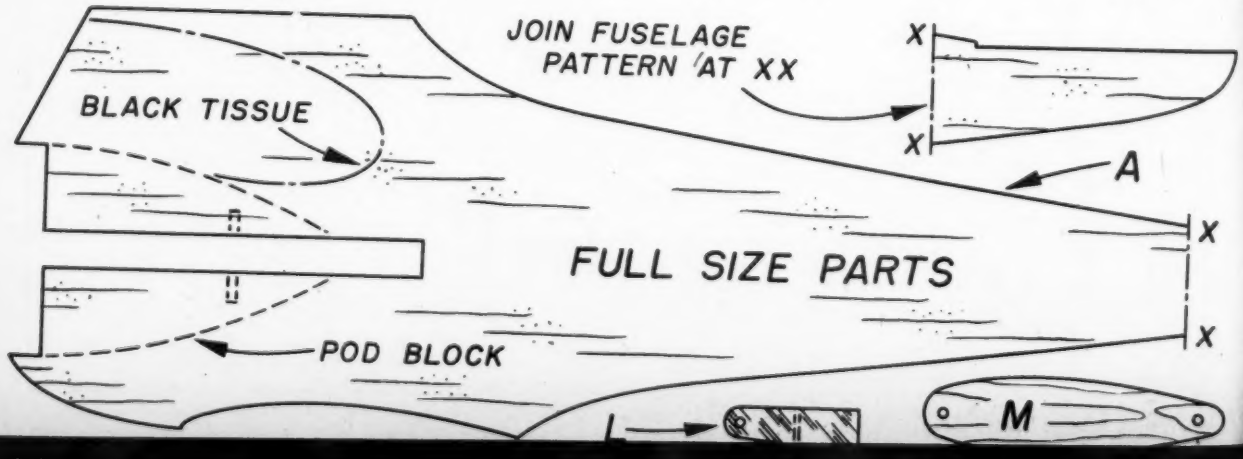
Young Half-A engine owners with a yen for something quick, purty, and sure fire in controlliners can make this model in an evening or two. Full size parts.

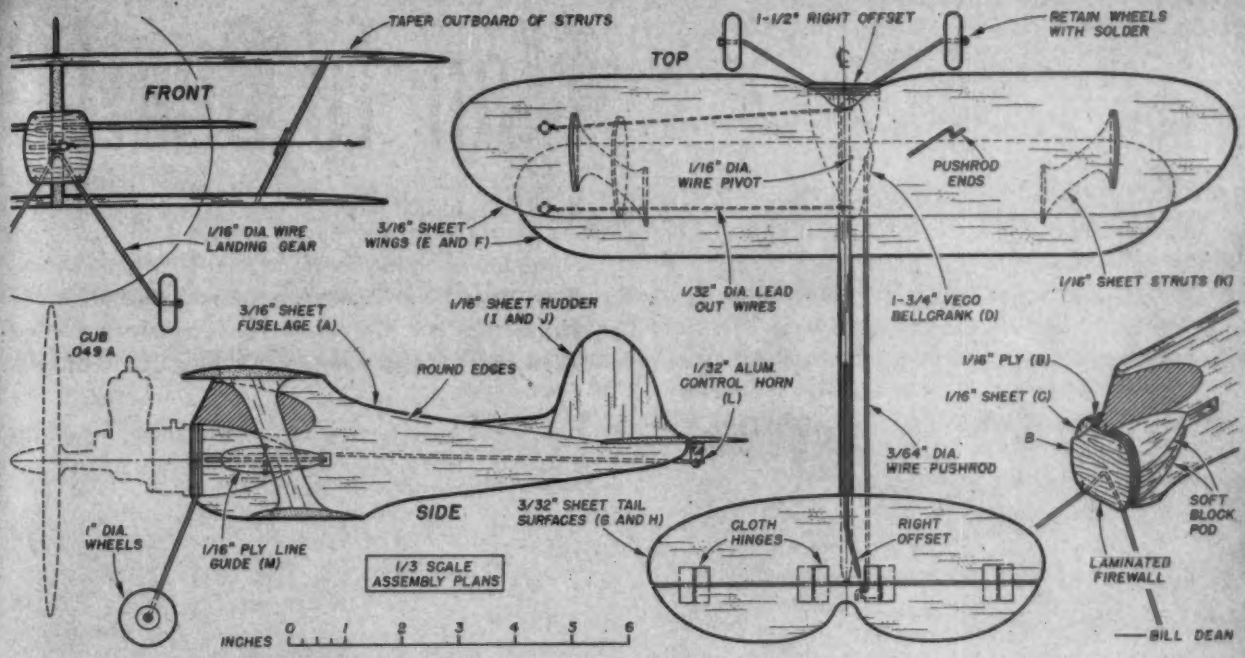
For control system details, compare this shot with one at top of the page. Shaped blocks that support the ply motor mount, cut out for bellcrank.

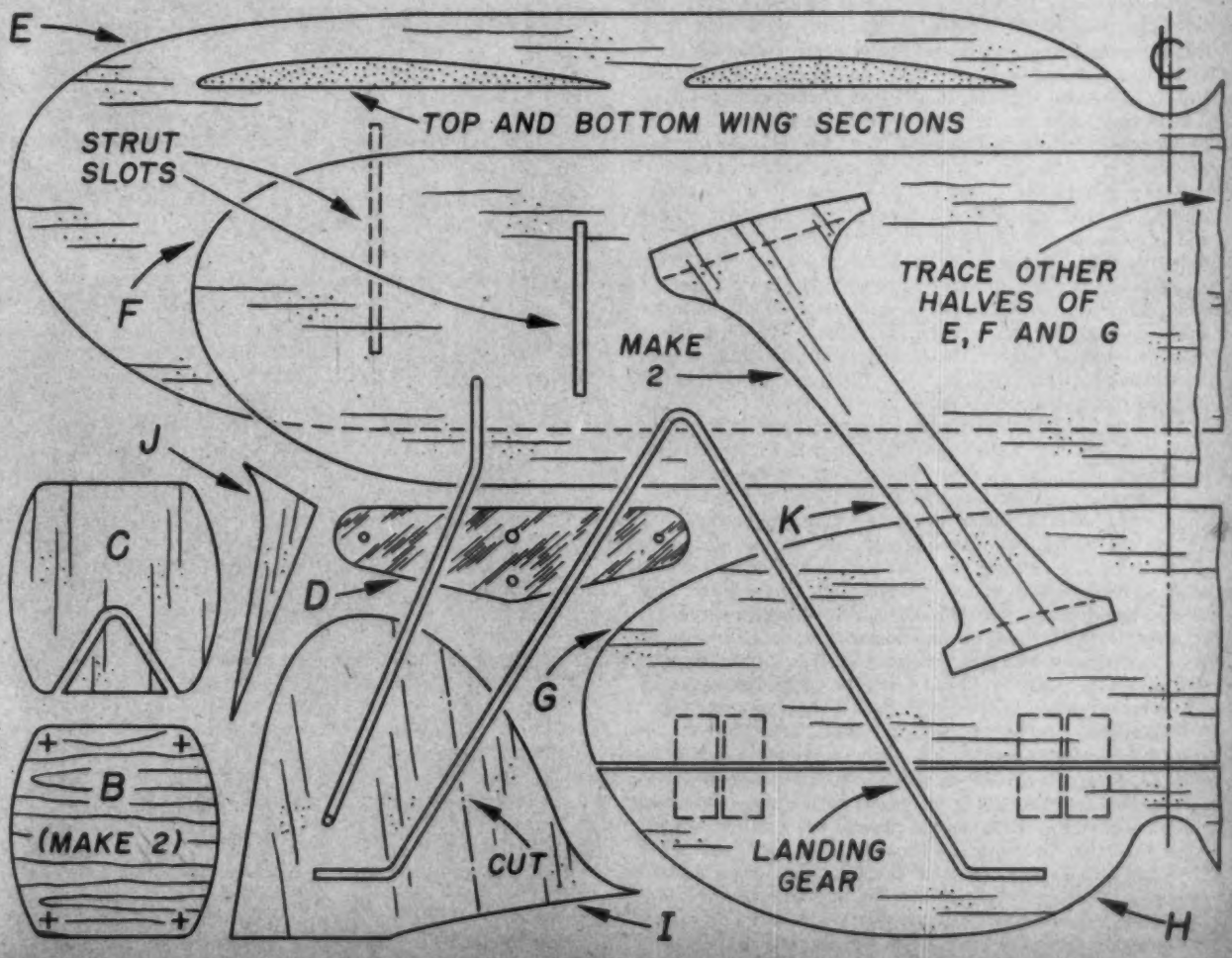
Here's a sharp-looking little biplane—and also easy to build. For best results, select wood carefully with an eye toward keeping the weight down as much as possible. Chose medium hard stock for the fuselage; very hard balsa for the wing struts; light balsa for the wings, tail surfaces and pod blocks.

Speed up production by using the full size part templates printed on these pages and you'll be able to turn out your Barnstormer Bipe in an easy evening's work. The original job was first tested with an old K & B but this has now been replaced by the new Cub .049A. Any similar size motor may be fitted with firewall patterns B and C being modified accordingly.

The construction is almost as easy as building an all-sheet hand-launched glider, so we'll skip most of the usual details and cover the important points (*Continued on page 42*)




TAPER OUTBOARD OF STRUTS
FRONT
TOP
1-1/2" RIGHT OFFSET
RETAIN WHEELS WITH SOLDER
1/16" DIA. WIRE PIVOT
PUSHROD ENDS
1/16" DIA. WIRE LANDING GEAR
3/16" SHEET WINGS (E AND F)
1/32" DIA. LEAD OUT WIRES
1-3/4" VECO BELLCRANK (D)
1/16" SHEET STRUTS (K)
3/16" SHEET FUSELAGE (A)
1/16" SHEET RUDDER (I AND J)
CUB .049 A
ROUND EDGES
1/32" ALUM. CONTROL HORN (L)
1/16" PLY (B)
1/16" SHEET (C)
B
3/64" DIA. WIRE PUSHROD
SIDE
3/32" SHEET TAIL SURFACES (G AND H)
CLOTH HINGES
RIGHT OFFSET
SOFT BLOCK POD
1" DIA. WHEELS
1/16" PLY LINE GUIDE (M)
1/3 SCALE ASSEMBLY PLANS
LAMINATED FIREWALL
BILL DEAN
INCHES 0 1 2 3 4 5 6


E
TOP AND BOTTOM WING SECTIONS
STRUT SLOTS
F
MAKE 2
TRACE OTHER HALVES OF E, F AND G
J
C
D
K
G
B
(MAKE 2)
CUT
LANDING GEAR
I
H

Man To Beat!

By R. J. BECKMAN

None has won higher honors, with less publicity than quiet Alex Schneider, who twice took the Nationals. It's high time that the story behind Alex and his many times modified Cub was told.

Schneider taxiing Cub to position for take-off. Consecutive loops, dives, inverted, etc., usually put him 50 points ahead of the next best man.

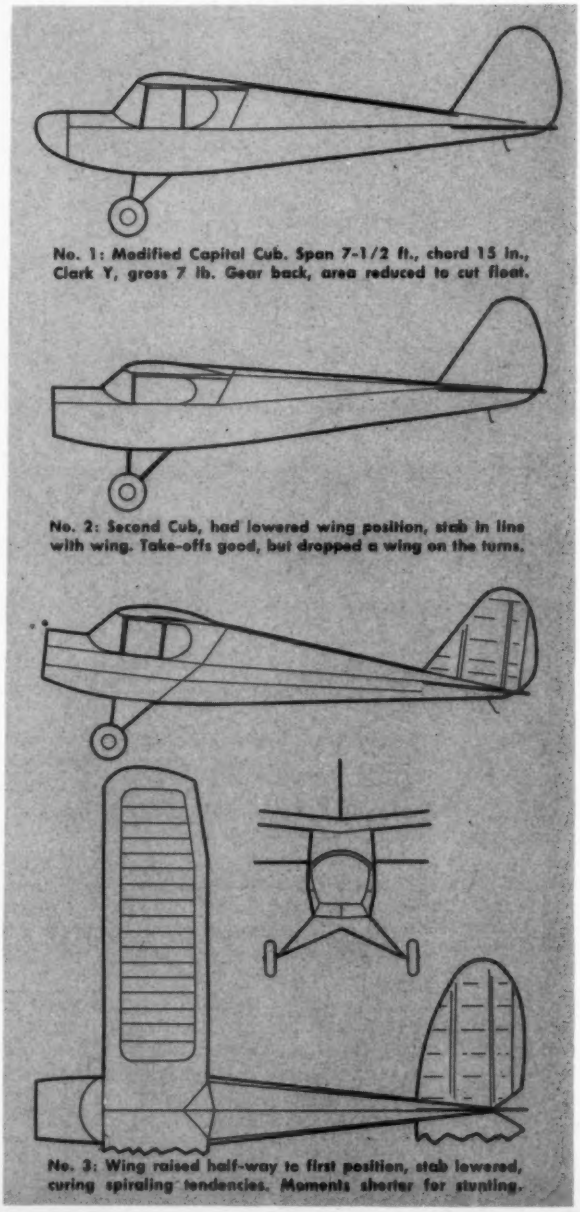
▸ Modelers who attended the 1952 and 1954 Nats saw Alex Schneider's semi-scale Piper Cub practically walk away with the RC event. This plane, the result of several years of development, was designed in the belief that an RC model should look and fly like a real airplane. In 1949 Ed Rockwood introduced his resonant reed control system which made this type of flying possible and at that time Alex and several other control-line fliers in the San Francisco area decided to try radio control.

Alex's first RC model was a scale Stinson 150 with a three-channel receiver affording independent right and left rudder and engine control. This ship was never very successful. The stab area had to be increased from seven per cent (the scale area) to 17 per cent before the plane would fly at all. Take-offs were a problem, with many days of nothing but ground loops and bogging down in the thick grass that covered the flying field. Hand-launching was never attempted; they don't hand-launch real airplanes and besides, at that time the club levied a $5 fine for hand-launching an RC model.

The first Cub was built in the spring of 1950. It was built from the plans to a Capital free flight kit of the Piper Cub. The model was very close to true scale, the only change being the usual increase in tail surface area. It had a 7-1/2 ft. span, 15 in. chord and Clark Y airfoil. The original flying weight was 4-1/2 lb., but the control equipment brought the total weight up to about 7 lb. The landing gear was lengthened in an attempt to improve ground runs in high grass, but that was the only change made. At first this ship didn't seem any more successful than the Stinson. The ground looping tendencies were so pronounced, even on a grass free runway, that it was very difficult to get the plane in the air. Once the plane was in the air it was very floaty and rather hard to get down again.

The ground looping problem was tackled first. The solution turned out to be re-positioning of the landing gear closer to the CG. The gear was moved back, in small steps, as far as was possible without rebuilding the plane. Each change improved the ground performance and the process was continued in the construction of later models. On the latest model the wheel axles are about 1 in. ahead of the CG. This gives straight ground runs on both take-off and landing with no nose-over tendencies on reasonably smooth fields.

Once the take-off problem was (*Continued on page* 52)



No. 1: Modified Capital Cub. Span 7-1/2 ft., chord 15 in., Clark Y, gross 7 lb. Gear back, area reduced to cut float.

No. 2: Second Cub, had lowered wing position, stab in line with wing. Take-offs good, but dropped a wing on the turns.

No. 3: Wing raised half-way to first position, stab lowered, curing spiraling tendencies. Moments shorter for stunting.

Import Review

By E. C. MARTIN

Concluding round-up of foreign engines, we find stimulating variety of trends in all classes.

OS Max-1 .35 Glow.

Taifun Tornado .15 Diesel

Elfin .09 Diesel.

Taifun Hobby .06 Diesel.

Mills .08 Diesel.

Mills .045 Diesel.

▸ With this concluding instaliment of Import Review we come to some of the most notable engines in the series and it is perhaps a fitting moment to express regret that space has prevented us from giving a fuller account of these and the other beautiful examples of model engineering already described. They must surely give every interested reader a feeling of comradeship with people he will never meet, who live, think and work differently, but who all have the common bond of oily hands, an appreciative ear and castor in their lungs. Some of these engines were made in large modern plants, while others, and may it always be so, were made in tin shacks by fellows who will never be wealthy, but abound in enthusiasm as lively as the engines they make, and should you visit their establishment, the chances are that you will be obliged to test run some engines or deburr a few castings in return for the privilege. But since every part has a pet nickname, you probably won't have a clue as to what you were doing when you've finished.

Mills 1.3 cc Diesel

In common with thousands of other modelers, the first Diesel we ever owned was a Mills 1.3, and such was the reputation it won for ease of starting, simplicity and lively performance on any kind of prop, that most purchasers became compression ignition converts overnight. The fact that it is still in quantity production and basically unchanged over the most progressive nine years in model engine history is a wonderful testimony to its excellence. There are many knowledgeable people who maintain that a Mills Diesel should be the required first step for anyone taking up power modeling and it is indeed difficult to think of a better choice. Our first Mills ran an estimated 400 hours before someone else took it over, and statistics like that, coupled with happy memories, tend to color one's approach to a report. A new design of which one has no previous experience has to be taken at face value and to be fair one should treat the Mills in the same way. Yet the result would detract from an engine that we know to be good.

For example, it is an old fashioned three-port design with minute port areas, extremely long stroke, gawky appearance, excessive over-all height, considerable weight and very large size for its power and displacement. On paper it shouldn't have enough steam to shame a modern .049, and yet a good Mills will often outshine a fussy modern engine of larger displacement, and do it with a degree of consistency and reliability that few can equal.

The reason for mentioning a "good Mills" is that these engines vary quite considerably in performance, as do all long stroke Diesels for some reason, but mainly because they are made of extremely long wearing materials and the slightest dimensional variation takes a considerable amount of running to rectify itself. We are talking of an engine with seven tenths of one ten-thousandths of an inch piston clearance, and a few millionths make quite a difference. Such accuracy means that you can set the piston at TDC, leave it overnight, then tap the prop next morning and the engine will plop around as (*Continued on page* 42)

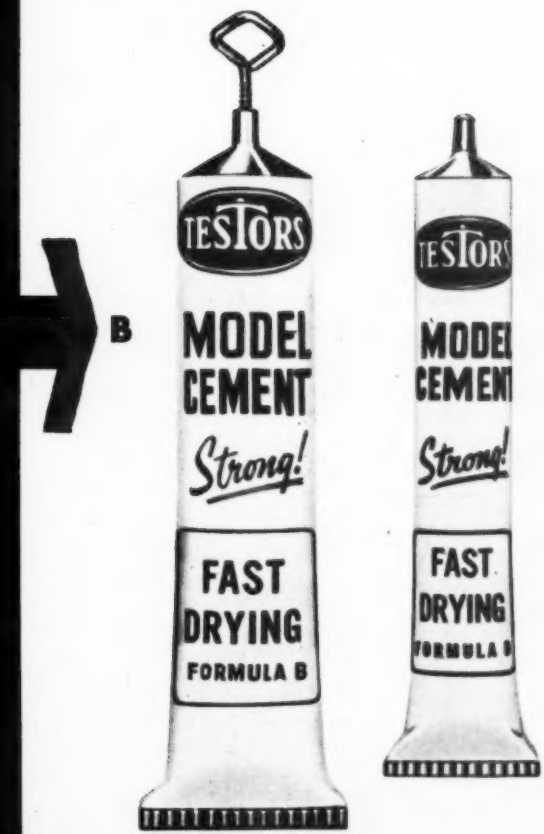
MODEL BUILDERS AGREE:

YOU NEED *Both*...

IN HANDY 15c AND 25c TUBES AT DEALERS EVERYWHERE

TESTOR CHEMICAL COMPANY
ROCKFORD, ILLINOIS

A



B

FORMULA A

. . . *extra-fast-drying* for quick, easy construction of lightweight models and for on-the-spot repairs. Guaranteed Hot Fuel Proof.

FORMULA B

. . . *fast-drying;* the *strongest* for balsa or hardwood . . . for metal to metal . . . for metal to wood . . . for all general work.

Uranium hunters are outnumbered by scale fans who look for suitable source material for dream ships. What all of them need is

PLANS FOR SCALE

▸ Despite magazines, manufacturers and hobby shops, which seemingly should satisfy every possible need of the hobbyist, one very important item is always in short supply. This is the scale model plan. As any model editor's mail quickly reveals, the average American model builder is interested in scale above everything else. He may want to adopt the scale plan to his special interest, whether it be U-control, free flight, or just solids, but he wants his model to look like an airplane.

Time was when the hobbyist who would build scale had a choice of working from an occasional magazine plan, or of working up his own drawings from published three-views that usually spanned about 2 in. But, if yesterday's modeler had no terror of making his own plans, which he did as often on wallpaper or butcher's paper as on honest-to-goodness drawing paper, today's builder is so accustomed to service that he is almost entirely unaware of the sources of information. Often he does not know what to do with the information when he gets it. It usually is in the wrong scale or has no cross-sections, or both.

What are the sources of scale model information? How do you convert that information into suitable model working drawings?

First source, of course, is the model magazines, both domestic and foreign. MAN, for example, publishes plans for scale free flight and U-control planes; the useful full size drawings for these ships are available from the Plan Department. Naturally, the choice, compared with the fantastically varied demand, is limited; otherwise, the article would end here. In addition to the plans specifically designed for flying type models, three-views in many sizes and scales appear frequently. Contrary to opinion, it is not overwhelmingly difficult to enlarge such drawings to more useful sizes, as we'll show presently.

Fortunately for scale fans, MAN makes available prints of the various fine super-detailed drawings made by William Wylam and Willis Nye. The popular Wylam items usually are twice page size; the Nye drawings, three times larger than published. Back issues of magazines, incidentally, usually are available from their publishers. An inquiry addressed to the editor will establish, first, if the subject you want was published and, secondly, in what form it was published, such as flying model form or just a three-view. You will be told if the back issue is in stock and, if so, what its cost will be. The cost of really old issues may run somewhat higher. In the case of this magazine, lists of available super-detailed or "masterplan" plans are enclosed with answers to inquiries that appear to require this background. Since MAN was first published in 1929, thousands of plans useful to scale modelers have been published and it is likely that you can find information on the plane closest to your heart.

On the pessimistic side, the magazines, this one included, seldom have all the back issues. After the 25th Anniversary issue of MAN was published last July, the demand for old copies exhausted the stock prior to 1941. However, publishers usually are willing to have photostatic copies made and will acquaint you with the facts when the back issue containing a requested plan is out of stock. When flying model plans appear, drawn to a reduced scale and not available as full size plans, it sometimes is possible to have the publisher obtain an ozalid print made from the original plans. Radio model builders frequently ask for such prints.

Many readers take the obvious short cut of having photostatic copies made directly from their own magazines. This is because the photostat can be made to any size and scale, up or down. However, as the area of the photostat becomes greater, the cost quickly becomes prohibitive. Also, because of copyright laws, the people making the photostat frequently require you to get the written permission of the magazine before they will make the copy. MAN always grants such permission, when the use of the (*Continued on page* 48)

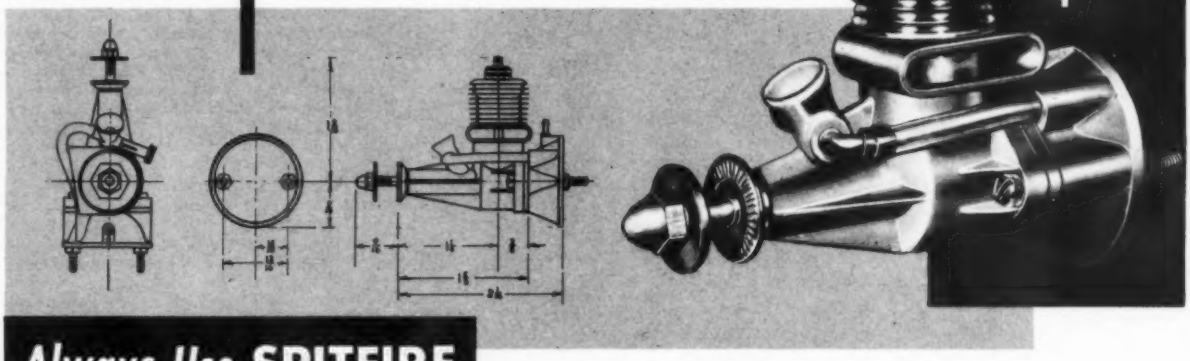
SPITFIRE PRODUCTS'...NEW .049

The 1955 Spitfire .049 was designed for the advanced model builder and flyer, who wants a small, lightweight .049 engine to power his new model. To assure complete satisfaction and 100% perfect operation **each SPITFIRE .049 is checked and TEST-RUN at the factory.** Like all other Spitfire Engines, the .049 carries a 90-day guarantee.

THE ONLY .049 WITH A SIDE PORT EXHAUST STACK

COMPLETE WITH PROPELLER GLOW PLUG CLIP AND WRENCH

$4.95



Always Use SPITFIRE FOR TOP PERFORMANCE

SPITZY
Factory Tested Easy Starting Ideal Beginners Engine Complete with...
PROPELLER
GLOW PLUG
CLIP
SERVICE WRENCH $3.95

NEW NITROMIC GLOW FUEL
Developed by Lew Mahieu—New and finer formula for quicker and easier starts.
Half Pint 55¢ Pint 95¢

GLOW PLUG CLIP
Quick, positive starts. Snap on or off easily.
15¢ each

Sensational New SPITFIRE GLOW PLUG...

...the greatest advance ever made in glow plug history! The engineering changes of the internal parts of this new plug, along with a new method of winding and a recently developed alloy in the platinum element, has evolved into a plug with a life up to three times longer than the former outstanding Spitfire Glow Plug. The new plug is slightly shorter, for better appearance, and is recognized by the satin-gold iridite* finish.

65¢

Designed and engineered by Lew Mahieu

*This is the same finish as required by the Navy for the best protective plating of steel.

See your local model and hobby shops.

SPITFIRE PRODUCTS CO.
P.O. Box 168, Compton, California

Now

"OPERATION R/C" easy as turning on a TV set!

THANKS TO BABCOCK.....you can now *go radio control* with professional ease and complete confidence. The *trouble-free* Babcock system makes radio control installation and operation a genuine pleasure. It's *"the one and only system you can trust implicitly in all environments!"*

Babcock

Lifetime • Fool-Proof • Military Type

RADIO CONTROL

Take tuning, *for instance!* Babcock's simple single screw tuning holds perfect adjustment for months of operation, one of the many Babcock features that spell *unmatched* RELIABILITY, your least costly and– *best investment, by far!*

Babcock SUPER-COMPOUND ESCAPEMENT

MOST VERSATILE MOST EFFICIENT

(four functions)...$7.95

● Special coaxial magnetic circuit guarantees *many times more efficiency* than that of any other escapement.

Babcock Elevator Servo (also for boats)..$12.50
Babcock BR-1 Subminiature Relay..... 9.00

BUY BABCOCK *From your local Dealer*

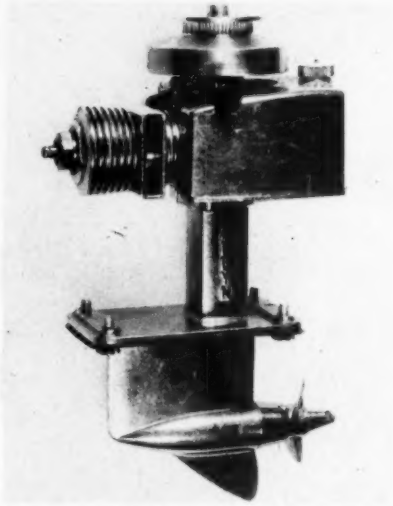
BABCOCK RADIO ENGINEERING, INC.
7982 Woodley Ave., Van Nuys, Calif.

Export Dept., Frazer & Hansen, Ltd., 301 Clay St. San Francisco, Calif., USA

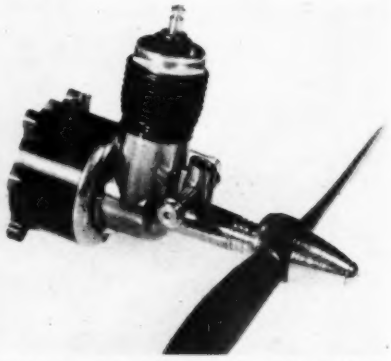
Engine Review

Two Allyn inboard boat engines and a new Cub, the .049-A, point up lively developments in the Half-A Class. An authority discusses significant features.

By E. C. MARTIN

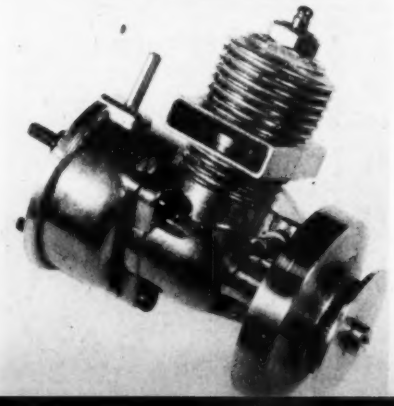


If you like outboard types, but not mounting on transom, unique Allyn inboard mount is deal.



Light but sturdy plastic tank on new Cub .049-A gives good run for small ukies. Note new case.

Knurled flywheel for pull starting, impressive compactness distinguish Allyn inboard engine.



Herkimer OK Cub .049-A

There is seldom a case where an engine we want to use in a particular installation is entirely suited to all our whims and fancies. The tankage may not be ideal, or the fuel line kinks, or we would prefer beam instead of radial mounting. We always, in fact, have to compromise. However, the OK Cub range of engines probably reduces compromising to the minimum in the .049 class, and the latest addition, the Type A, provides yet another choice of mounting and tankage of very neat design.

The engine appears to be basically identical with the .049-B, having the same piston and cylinder assembly, crankshaft, prop driver and spinner, and needle valve assembly. The cylinder head now has a recess for the plug gasket and although the crankcase casting is entirely different, the Type B crankcase cover is used complete with tapped center hole and wide gasket, so that the B fuel tank can be fitted if desired. For those who dislike the extra overhang inherent in tank mounting, the B tank permits a very neat radial installation via the new machine-faced crankcase flange, with concealed bolt heads.

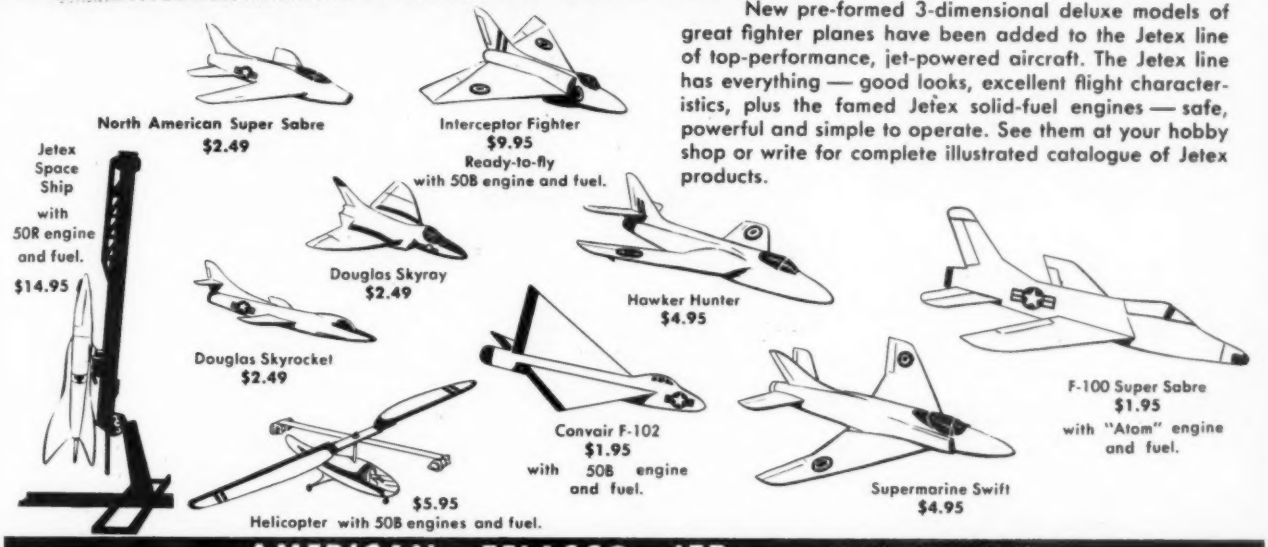
However, we are jumping the gun, as the tank supplied is a beautiful nylon molding of remarkable strength and lightness, which at first glance hardly appears capable of withstanding any impact. A little tentative squeezing soon convinces you of the remarkable qualities of this material and lends credibility to stories of its use for conrods and other highly stressed parts. Four screws with their heads at the back of the tank extend through into tappings in the crankcase flange. As these screws are disposed on the horizontal and vertical center lines of the engine, the top screw actually goes into the cylinder, and it is vital not to use any other screw of incorrect length in the event of loss, as the end may impinge on the cylinder barrel and distort it. It is equally important not to leave it out, as crankcase pressure escapes through the hole and the engine will not start.

Four diagonally placed lugs 1/8 in. thick project from the tank for mounting, and we can dispel any doubts as to their strength, for although they will flex slightly, no normal flying accident is likely to break them. Vent and filler tubes are an integral part of the molding and the fuel line is carried through a well-fitting hole in the circular crankcase flange into the tank to form a very neat assembly.

In order to bring the vents into the correct position for controlline use, the engine may be rotated in increments of 90° by virtue of the equally spaced bolts. By the same means, side and inverted mounting may be arranged, although the needle valve becomes a little more critical as a result of the consequent gravity feed.

In conclusion let us say that the molded tank is a valuable development on a sound and proven engine. Performance is similar to the Types X and B (*Continued on page 33*)

Jetex Squadron Out Front in 1955



New pre-formed 3-dimensional deluxe models of great fighter planes have been added to the Jetex line of top-performance, jet-powered aircraft. The Jetex line has everything — good looks, excellent flight characteristics, plus the famed Jetex solid-fuel engines — safe, powerful and simple to operate. See them at your hobby shop or write for complete illustrated catalogue of Jetex products.

AMERICAN TELASCO LTD., *Huntington, N.Y.*

Engine Review

(*Continued from page 32*)

engines previously tested and the engine comes with the same Kaysun 5-1/2 x 4 prop on which it turned 14,500 rpm after 20 minutes' running.

The Allyn Mar Fury .049

The Mar Fury is a new addition to the growing line of variants based on the highly successful Sky Fury engine (MAN, 5/54) and provides for those who want a conventional inboard marine unit. It is identical with the Sky Fury in every respect except for the substitution of the prop driver, prop washer and retaining screw with a flywheel and flywheel retaining screw. The flywheel is common to the Sea Fury and may be fitted to a standard Sky Fury without any other changes. Provision for prop shaft couplings is left to the owner and the main advantage of the Mar Fury is that one may purchase a purely marine unit without any unnecessary airplane fittings. Rotation is conventional.

The Allyn Sea Fury Inboard .049

This is another adaptation of the basic Sky Fury that will arouse considerable interest, as it provides a complete power package for the inboard fan that eliminates all the usual inboard drive line and fittings and may be installed by the simple expedient of cutting a suitable hole in the bottom of the boat to suit the gasket template supplied, and then drilling four bolt holes. The prop shaft assembly is then removed with a wrench supplied and the lower end of the unit inserted through the hole to bring the mounting plate flush with the bottom of the hull. Four countersunk screws then go through the bottom and into tappings in the mounting plate and the shaft assembly is refitted and the boat is ready for the water. The job can be completed in 15 minutes.

There are, however, several points which require special attention in the construction of a boat intended for this unit. The flywheel pulley is located 2-1/2 in. above the mounting plate and considerable leverage is exerted on the plate during starting with a pull cord. There is, therefore, a danger of the screw heads pulling through a balsa bottomed boat and the use of a sturdy plywood bottom suitably strengthened with formers is strongly recommended. This makes the use of a flat bottomed hull almost compulsory. But since this unit is best suited to a hydroplane hull and is ideal for "quickies," it is no disadvantage. Those planning on scale realism will settle for the extra work involved in installing a Mar Fury. Both engines lend themselves readily to the fitting of exhaust extensions and simple ducts from brass shim stock can be slipped through apertures in the hull to fit over the engine stacks. No sub-piston induction is featured on the Fury engines and elaborate exhaust systems can be fitted without spoiling flexibility and power, provided that back pressure is avoided.

Mechanically the inboard version is similar to the outboard Sea Fury, having the same power head and transmission gear to the prop apart from a vertical drive shaft that is 1 in. shorter. The fuel tank is at the back instead of the front, and the lower unit casting is considerably sturdier and stubbier and affords a lower center of gravity. Since this enables its efficient use on smaller hulls, someone interested in speed is sure to convert this lower end for outboard use, and either by coincidence or because it is more efficient we got higher speeds on the same hull with the inboard. However, the inboard lower end, with no cavitation plate, set up in an outboard position, may well tell a different story.

The wrench supplied with the inboard is a combination type which fits plugs, shaft gland and cylinder head. It is nickel plated and at 25¢ is well worth having for any of the Fury range.

Having enjoyed a considerable amount of

(*Continued on page 48*)

WORLD ENGINES - FREE AIR MAIL

Webra

WEBRA MACH-1 .15

THE WORLD'S HOTTEST DIESEL - Easy to start. Well exceeds .30 bhp. Features TWIN BALL BEARINGS and ENORMOUS PORTING and other expensive refinements blended into a lightweight compact, rugged engine. $13.95

Webra

WEBRA .049 Cu. In. PICCOLO

Ground Contra-piston eliminates replacing compression ring. HP .075 at 14,000 RPM. Put this little BULLDOZER in that 1/2 A contest job (especially PAA)

PICCOLO - Shown $7.85

WEB - WINNER .15 cu. in. Most Popular European Engine $9.95

WEBRA RECORD .09 cu. in. Excellent for R/C $8.85

WEBRA WINNER 2 SPEED

New a BEAM Mount 2 speed Winner for R/C work. This engine develops extremely high torque in the 10,000 to 12,000 rpm range ideal for R/C. $12.50

NORWAY'S ANDERSEN .15 DIESEL. How it is THE BRUTE. Powerful. Styled with Chrome Plated Head and Grey Mat Finish. A smooth running, high torque engine $13.95

NEW ELFIN .15 Cu. In. "REED"

A new ball bearing reed valve extremely high performance ELFIN. This engine is unusually easy to start. Reed valve fuel induction. New style rugged crankcase... $16.95

GLO 35

OS MAX 35 - STUNT

The hottest .35 in the world. Horsepower .70 at 17,000 RPM. Comp. Ratio 8 to 1. Displ. .355 U.S.A. Glo Plugs fit Max .35. Complete with dust covers and 2 Venturi Inserts.

HOT - Only $11.95

FAMOUS OLIVER .15 DIES $24.95

ALL ENGINES GUARANTEED BY WORLD ENGINES AND MANUFACTURER. WORLD ENGINES HAS PARTS AND SERVICE.

ORDER — At Your Dealer — Or Free Air Mail Direct From World Engines — Send Check — Money Order — $1.00 With C.O.D. Orders. 24 Hour Service.

MR. DEALER — We are sole U.S. Distributors for these quality engines. Sprinkle a few of these gems in your showcase — you will be seeing the boys from the neighboring cities.

WORLD ENGINES
P. O. BOX 905
WARREN, OHIO

P. G. F. CHINN

FOREIGN NOTES

A monthly world-wide round-up of technical developments, designs, significant industrial products.

by P. G. F. CHINN

Winner Cuban "23/29" intermediate speed event. Twenty-three maximum span; .29 maximum engine. Other combinations possible.

Germany: 1955 World Championships

We learn, from our German MFK (model committee of the Deutscher Aeroclub) correspondent, that all is not clear regarding the final arrangements for the World Championships events scheduled to be held at a USAF airfield in Germany on September 3-4. At this writing, it appears that the MFK await instructions from HQ, USAFE. It is being rumored, incidentally, that Russia, Poland and Czechoslovakia may be represented at the Championships. Doubtless, the situation will be sorted out in due course.

The MFK, incidentally, are anxious to correct the impression that Germany was unwilling to cooperate in the running of the three-event (Wakefield, FAI Power and A.2) Championships. MFK member Hans Pfeil says that the German authorities would have been glad to stage the three events, *plus* the International Flying Wing contest *and* the King of the Belgians RC event, also won by Germany in 1954. The inevitable heavy financial outlay needed for such a meet, however, was quite beyond the resources of the Deutscher Aeroclub and, for this reason, it was apparently thought advisable to limit commitments to single events. Evidently, the possibility of the U.S.A.'s shouldering some of the burden had not been correctly understood, hence the MFK's subsequent reversal of their FAI conference decision (previously reported in FN).

France: World Speed Championship

May 29-30, the dates fixed for the controlling World Championship event in Paris, should see an interesting gathering. Since the 1955 World Speed Championship will be decided by the performance of 2.5 c.c. class (.15 cu. in. displacement) models, the contest is bound to have a much more international flavor in respect of the equipment used than would be found in the 5 c.c. (.29) and 10 c.c. (.60) classes where U.S. motors are predominant and would be employed by the majority of contestants.

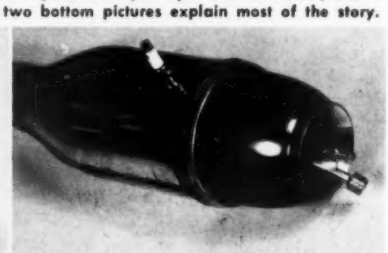
The American Torpedo .15 engine will doubtless be well to the fore, but a strong challenge should be forthcoming from the Italian Super-Tigre G.20S (present World 2.5 c.c. record holder at 118.35 mph) while a dark horse is a new glow plug racing version of the German Webra Mach-1, which may also be seen in British hands. A Webra works entry is scheduled to appear in the shape of a new and highly modified Mach-1 Special which has been built by designer Gunther Bodemann for the meet. However, it is by no means certain that Peter Wright's special E.D. 2.46 will be outclassed. Wright won the 2.5 c.c. class last year at 111.8 mph, using this engine, and has been the most consistent 2.5 c.c. class performer in Europe for the past three years. He is also now using K & B .15 and glow-Mach-1 models.

England: New Canned RC

We remember reading, about four or five years ago, an article in which the author declared that it was ridiculous to suppose that model RC gear would ever reach the stage where it could be bought ready-to-go and, like a domestic radio set, would demand no technical knowledge on the part of the operator. In fact, some American commercial gear has come quite a long way toward such a stage. Perhaps the most dramatic demonstration of foolproof model radio control, however, comes with the entry into the model RC field of the vast Lines Bros. organization in England, who have the biggest *toy* factory in the world.

At a recent trade exhibition, this manufacturer demonstrated a new product in the shape of a ready-built radio controlled model boat, which is actually intended to sell over toyshop counters. The sealed, (*Continued on page* 35)

Similar to the successful, popular American Dyna-Jet is Japanese OS pulse jet. Claimed thrust, 3-3/4 pounds. If you wonder what is inside a pulse jet, two bottom pictures explain most of the story.



Guillow's New TRIXY

45" Wing Span U-Control Model

Wing Area .....435 sq. in.
Overall Length .....30 in.
Weight .....1½ lbs.
Engine .....19 to .36 cu. in. disp.

A swept-wing beauty with the lines of a modern jet fighter. Designed by LOU ANDREWS, the TRIXY out performs anything ever seen at the end of a control line. This completely pre-fab kit has everything except engine and tank . . . all parts are pre-formed and smoothly rounded . . . ready to assemble. Take our word, get down to your hobby dealer and see this stunning new kit . . . you'll be amazed at its value!

PAUL K. GUILLOW Inc. WAKEFIELD, MASS.

If not available at your Hobby Dealer send direct to factory adding 25¢ packing and postage in U.S.A., 40¢ outside U.S.A.

Foreign Notes

(*Continued from page* 34)

single hard-tube receiver used in this boat will also be available in an aircraft version. It includes a special double pole, twin armature relay and employs "printed" wiring. The boat version also includes a servo gear giving motor speed control and reverse in addition to rudder. We hope to give more detailed technical information on these outfits as soon as permitted by the manufacturer. The units will sell under the name "Tri-ang," trade mark of Lines Bros. Ltd., who, through their subsidiary, International Model Aircraft, Ltd., also make the well known "Frog" line of engines, kits and accessories.

Australia: Long Distance RC

As a result of interest aroused by the bay-crossing contest staged near Melbourne some months ago (and subsequently reported in this column), long-distance RC flying seems to be gaining attention in Australia, particularly in Victoria, and a 40-mile hop is reported to be the aim of Norman O'Farrell, who took second place in the bay crossing. To solve the problem of control, Jim Fullarton has suggested (as an alternative to the expense of air-to-air control) making flights over suitable open country road routes so that a car could be used for escort duty.

Such a method might be difficult for some of us to picture, used as we are to crowded highways, but it might well be possible to escort a model for 100 miles or so, given a suitable road.

Cuba: Revival of C/L Speed

The "plus-and-minus-36" class speed model, originated by J. C. Mas, Aeromodeling Director of the Nacionale de Deportes (and described in FN, October last) has undoubtedly given the hoped for tonic to controlline speed, reports Tony Alvarado from Havana. As a development of the plus-and-minus-36 formula, a "23/29" class was evolved (23 in. minimum wingspan, 29 cu. in. maximum engine displacement). Now, interest in speed events is sufficient to justify inclusion of all AMA speed classes in Cuba's 1955 contest schedule.

At a recent meet there were two incidents which, once again, point the need for rigidly enforced safety rules, even if only to save needless wrecking of models and engines. First, model took off, went into wingover and spread itself over runway. Examination revealed that the 20G pull-test had buckled the bellcrank which was made from soft aluminum. Second incident concerned a model which some modelers declared would not survive a test flight. It didn't, for the engine, complete with mount and tank, "escaped" while model was circulating.

Incidentally, our Cuban correspondent is another modeler bitten with the idea of long-distance RC and suggests an American attempt to reach Cuba from Key West, Fla., a 90-mile hop.

Japan: Improved OS Jet

We have one of the new OS Type II jet units, which seems to be quite a good job. Japan is the only country outside the U.S. which has taken seriously to the pulsejet. In fact, in proportion to the number of models of all types, it would seem that Japan has devoted more attention to pulsejets than any other country.

The OS Type II is reported to deliver a thrust of 3¾-4 lb. and to have propelled a test model at 155 mph. This compares with the figure of 141.2 mph reached with an OS Type I jet in establishing a Japanese national record.

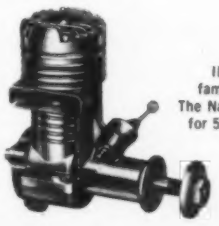
The Type II has the same general dimensions as the American Dynajet, but is a little lighter at 14 oz. The valve head and venturi are well executed diecastings, over which a red anodized spun aluminum cowl is fitted. A ten-petal flutter valve is used and a spare valve is included with each motor. A trembler

In a class by itself!

FOX

the finest name in model engines

When you fly a FOX you know you fly the finest . . . the engine that outperforms all others. To complete your patterns with snap and precision . . . to enjoy the thrill of superior performance insist on a FOX engine.



Illustrated is the famous FOX 35 . . . The National's winner for 5 straight years!

FOX MANUFACTURING CO., INC.

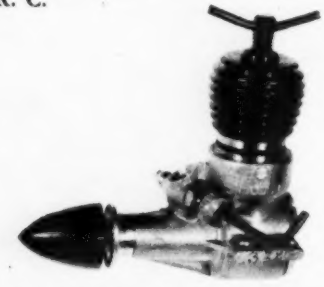
1219 N. 32ND ST., FORT SMITH, ARKANSAS

Taifun "Hobby"

SMALL IN SIZE—BIG IN POWER

THERE'S A PLACE IN YOUR HOBBY FOR A "HOBBY" DIESEL ENGINE

An excellent engine for those desiring the finest in its class. Easy starting, smooth running, unsurpassed for A Free Flight, Control Line and R. C.



10.50
C.O.D.
or at your
Dealers

MADE IN
WESTERN GERMANY

This engine has been rated as one of the most powerful engines in its class yet tested in a recent test conducted by Ron H. Warring of the British, "AeroModeller" magazine.

TECHNICAL DATA

Capacity 0.06 Weight 2 ozs. Speed 17.00 RPM Output 0.14 HP

Each engine is furnished with test block, neoprene fuel line, spinner and wrench.

SEND 3-CENT STAMP FOR ILLUSTRATED CATALOG

DEALER INQUIRIES INVITED

WILSHIRE MODEL CENTER

1326 WILSHIRE BLVD., SANTA MONICA, CALIF.

A NEW RELIABLE 2 TUBE RECEIVER

IT'S HERE!

THE SPECIAL — UNIQUE — EXCLUSIVE
ESSCO EJL CASCADE QUAD RECEIVER

FEATURES

LOW 1st stage idle curret. Extended battery & tube life. 500 hrs. and more on RK-61 tube. Stable Sensitivity due to low idle current—Simple & STAY PUT tuning adjustments. THE ESSCO QUAD CONVERSION KIT allows you to convert all older model Lorenz Receivers.

MORE FEATURES

THE ESSCO QUAD CIRCUIT keeps 2nd stage always under control. Current rise up to 3-4 ma with signal if desired. Use any preferred tube in 2nd stage. An inexpensive hard tube gives you reliable & economical relay operation. Silver mica condensers used in input stage for stability. An exclusive ESSCO FEATURE. NEED WE SAY MORE?

COMPLETE BASIC PARTS KIT includes all required components, drilled base, wound input coil, National R33 RFC, cable plugjack, tube clamp & special submin control pot. (less tubes) ..... $ 6.95

WIRE-TESTED—READY FOR USE 16.95

MODEL B QUAD H. Q. Parts Kit, complete as above, with tubes and the uncomparable PRICE ELECTRIC relay 18.95

THE ESSCO MODEL B QUAD RECEIVER WIRE-TESTED, READY FOR INSTALLATION—THE ULTIMATE IN RELIABILITY ..... only 23.95

CONVERSION KIT, easily converts all LORENZ receivers to the NEW ESSCO EJL QUAD circuit, Model NA available for North American Twin Tubers 3.45

COMPLETED SUB-ASSEMBLY requiring only 3 connections for installation in your set 4.95

CONTROL POT. required extra. Subminiature type.....$1.00, Miniature..... .60

PRINTED CIRCUIT method is not used on these ESSCO receivers. Only 2 pcs. of filament wiring totaling 3½ in. is used. All other connections are made by direct termination of components. A comparable P.C. assy calls for 6 to 8 in. of fragile etched wiring with possibility of open circuitry caused by vibration & stress. This additonal wiring adds undesirable capacity in the high frequency tuned circuits. We guarantee that our time & flight tested method is far superior & will outperform all other sets.

SPECIAL—THE NEW AEC MAC III RECEIVER, as featured in Air Trails. THE ESSCO H. Q. Parts Kit includes all specified components of the very highest quality, tubes, drilled base, wound coils and relay if desired. Price? — ESSCO's price is lowest because ESSCO's quality is TOPS.

ARE YOU ONE OF THOSE DIEHARDS THAT STILL PREFER SINGLE HARD TUBE RECEIVERS? Then you will be interested in the NEW ESSCO SUPER MINI MAC. A reliable and sensitive LONG RANGER that features low A & B battery drain. Complete parts kit includes SIGMA 26F Relay $14.95

Serving the Entire R/C Field
ESSCO - NEW YORK
58 WALKER STREET
NEW YORK 13, N. Y.

To Serve the Mid-West
ESSCO - MIDWEST
Coming Soon
Watch for Address

Serving the West
ESSCO-WEST COAST
670 BELL STREET
PALO ALTO, CALIFORNIA

coil for starting is available as an extra from the OS company.

In Brief . . .

New Zealand: Noted N. Z. modeler Frank Bethwaite, who already holds the World's record for RC sailplanes with a flight of two hours, is now reported to have set up a new powered RC record of 3 hr. 2 min.

England: Following the interest aroused by the appearance of the Atwood and Allyn outboards, a complete lower assembly for converting existing Half-A class Diesel to outboard use is now being made by A. Walshaw of Lytchett-Minster, Dorset. The unit utilizes bevel gear drive to prop, with backplate power take-off.

Norway: Until recently, there had not been much RC activity in Norway, through lack of a free band and restrictions on imports, and to Walt Good's ubiquitous Rudderbug falls the honor of being the first Norwegian-built RC job to perform a perfect loop. Flight was made during a contest on a frozen lake near Oslo.

Czechoslovakia: Winners of the 1954 East European Internationals, Czechoslovakia will stage this year's contests at Vrchlabi in northern Czechoslovakia. Events will be spread over 14 days during late July and early August. There will be five categories: Towline Glider (Nordic A.2), Free Flight Power, Rubber, FAI Class I Speed (.15 cu. in.) and Jet Speed. Each country will be eligible to enter two members per event. However, teams are limited to a maximum of five members. Thus, each team member will have to fly in two classifications.

Last minute report, as we close these notes, reveals that Czechoslovakia will attend World C/L Championships in Paris, using a new .15 motor designed and built by Sladky and Husicka, noted Czech speed experts. Report also confirms Czechoslovakia's intention to participate in free flight World Championships meet. END

the RE-8

(*Continued from page* 14)

constructed, easy to fly ship is hard to beat. But don't take my word for it; the plans are here, try one yourself.

The tail is easiest, so let's get it out of the way first. Saw the fin and rudder out of 1/4 in. sheet balsa; the stabilizer and elevators from 3/16 in. sheet balsa. After they are sanded to shape, notch the rudder and elevators for the control horns. The elevators are also grooved out on the bottom side and the joiner wire and the horn wires are cemented flush with the bottom. Cement the tubing for the hinges in place and dope silk around each length for reinforcement. Dope silk covering over each part and set aside for final assembly.

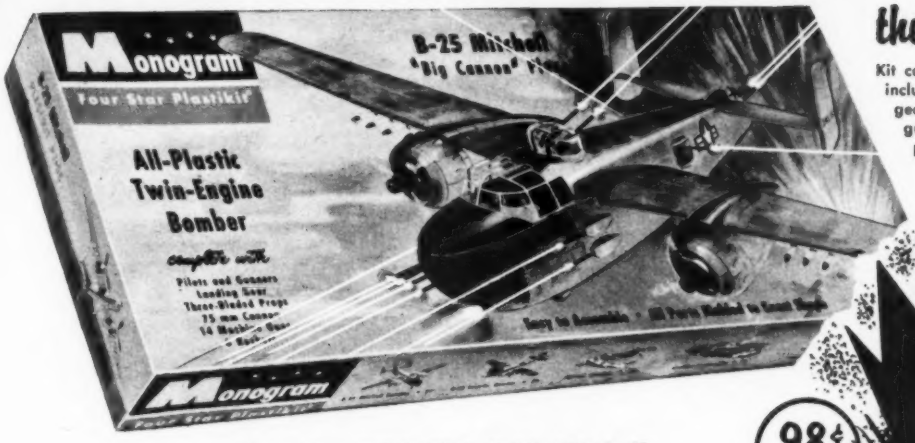
We'll need the lower wing before the fuselage can be completed, so let's do the wings now. They are both built in three sections, of conventional construction methods, so I will just emphasize a couple of features.

Finish the center section of the top wing. Run the 1/16 in. diameter cabane strut attachment wires into place and cement well before the outer panels are cemented to the center section.

If care is used in locating the strut locator ribs C and D when building the four outer wing panels, the wings will line up automatically on final assembly.

All of the 1/16 in. plywood rigging wire locators are set flush with the top of the lower wing ribs. All the rigging locators are set flush with the bottom of the upper wing ribs, with the exception of the four kingpost rigging locators which are set flush to the top of the upper wing ribs.

It's a good idea to make up the kingpost and its rigging before the wing is covered. Drill the holes in rib C and spring the 1/16 in. dia. wire kingpost into place. Angle drill the plywood locators and fit the 1/32 in. bent



the complete kit!

Kit contains all parts molded to shape, including 2 pilots, 2 gunners, landing gear, 75mm cannon, 14 machine guns, 6 rockets, 2 three-bladed props. Decals too.

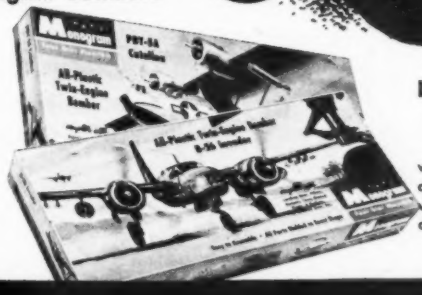
15 Gun All-Plastic Knockout by Monogram

98¢ each

Have Fun With This B-25 Mitchell and Other Monogram Twin Engine Bombers

Get this new all-plastic B-25 fellows — the famous bomber flown by General "Jimmy" Doolittle. Then get its mate, the B-26 — the slick Invader with the terrific fire power. And of course, you've got to have "Old Dumbo," the Catalina PBY-5A patrol bomber.

Boy! What a collection these three will make! Out on the "strip," side by side — rubber wheels, authentic landing gear, crew visible through the crystal-clear "greenhouses," flashing colorful insignia and markings. Next to real planes they are the real-est you have ever seen. Get them all fellows and have fun. If no dealer near you write to address below. Enclose 25 cents extra to cover packing and postage.



Last Word in Realism and Fine Detail

This is it fellows. The very finest in molded plastic aircraft. You'll be amazed with the perfect detail—right down to the last rivet.

Monogram Models INC ★ 3421 West 48th Place • Chicago 32

wire rigging, using the cut and try method. The rigging wires can be bound with thread and cemented at the top of the kingpost. Spring tension will hold this assembly in place. However, it must be removed until final assembly. Cover the top side of the lower wing and the bottom side of the upper wing with silk and set them aside for final assembly.

Cut the fuselage sides and doublers from 1/8 in. sheet balsa. Cement the doublers to the "in" side of each full length side and cement the 3/8 x 1/2 in. hardwood motor mounts to the doublers. Score each side just aft of the doublers and break slightly. Cement bulkheads 1 through 8 to one of the sides. When they are about dry, cement the other side to these bulkheads. Add bulkheads 9, 10 and 11. Cement the No. 3 Darwin stunt tank and the top of No. 3 bulkhead in place.

Prepare to install the control system. Cement the 1/8 x 1/2 in. plywood bellcrank mount in place between the motor mounts. Bolt a Veco bellcrank to the mount. Drill the sides of the fuselage for the eyelet bushing for the Veco elevator control horn. The wire legs of this horn must be cut off to the proper length. Put the horn in place. Pin the bellcrank and the horn both on neutral and solder the 1/16 in. dia. pushrod in place. The scale exterior horns will be added later.

Bend the 1/16 in. wire cabane struts to size. Use thread to sew the struts to No. 4 and No. 7 bulkheads. Cementing the thread liberally makes this very strong. Bind and solder the strut ends. Now bend the undercarriage struts to shape and sew them to No.'s 5 and 6 bulkheads. Cement liberally (this is very strong and has stood up under some terrific jolts). Slide the lower wing into position and cement well. When this is dry, the undercarriage strut ends and the 1/16 in. spreader bar wire can be bound and soldered. Don't forget to cement the 1/16 in. wire rigging hooks in place at this time

Plank the fuselage from No. 3 and No. 7 bulkheads with 1/8 x 3/8 in. balsa strips. Shape the block for the rear gunner's pit and cement into place. Note that this block starts at bulkhead No. 7 and forms the rear half of the front cockpit. Cement the stabilizer, 1/4 in. sheet filler, turtledeck and fin into place. The airscoop, skid reinforcement and skid follow. Plank the bottom from No. 3 and No. 11 bulkheads with 1/8 in. sheet balsa and finish the bottom off with the block from No.'s 1-5 bulkheads. The noseblock and the balsa fairings on the cabane struts, undercarriage struts and tailskid will finish this assembly. Dope silk over the entire fuselage and strut assemblies.

The entire assembly can now be finish-doped in preparation for final assembly. Dope the roundels and stripes on the fuselage and the numerals on the fin. Finish-dope the bottom surface of the upper wing. Cement the windshields and gunsight into place before final assembly.

We're now ready to assemble the top wing into place. Make the four interplane struts and the two aileron spanner struts out of 1/8 in. plywood sandwiched between 1/16 in. sheets of balsa. Sand to shape and finish-dope olive drab. Cement the struts into the sockets of rib D. Before these have set up completely, slide the upper wing into place and cement the struts into the sockets at rib C. Cement the aileron spanner struts into the 1/16 in. plywood locators. If the builder has used care in sawing out ribs C and D and the interplane struts, and has located these ribs properly in the wing panels, the wings will be automatically lined up. It is, however, a good idea to double check the alinement. When the interplane struts are dry, you may bind the cabane struts to the wing attachment wires in the center section of the top wing. Check the alinement carefully before soldering these four places. I like this method of holding the wing on for two reasons: first, my biplanes which have used this system have never lost a wing despite some really rough treatment; secondly, if a builder hasn't achieved proper alinement, the tops of the cabane struts can be bent slightly to accommodate the error.

The rigging wires may now be installed. Take four long pieces of 1/32 in. wire and bend sharply in the center to make a long V. Use thread to bind the points of two of the V's to each rigging wire hook at the fuselage side and fit the free ends through the locators in the upper wing. This forms the flying wires B and C. Install the rest of the wires (the cut and try method) and then solder a washer to the end of each. The wires will probably still rattle back and forth. This can be stopped by cementing liberally around each washer. Once the rigging is completed, the top side of the upper wing and the bottom side of the lower wing can then be covered and finish-doped.

One of the big problems of World War I fans has been solved. Beautiful 2-1/2 in. scale rubber tired wheels, suitable for 1 in. scale World War I type models, can be obtained from the Scalemaster Model Co. of Grand Rapids, Mich. True scale wheels really "make" any World War I model, and these are heart-warming.

We're now ready to apply the finishing touches. Install the elevators by running the 1/16 in. wire "axle" through the tubing on the stabilizer and elevators. Crimp the two end tubes to retain the axle. Pin the bellcrank system and the elevators in a neutral position. Solder the 1/16 in. brass horns to the Veco horn ends protruding from the fuselage. Use stranded wire cable for the control wires; bind and solder each end. They must be drawn fairly tight. Cement the rudder in place and solder the dummy rudder control wires in place.

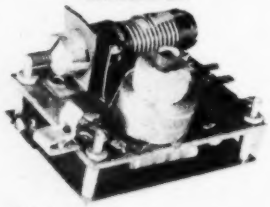
Make the guns and exhaust stacks, dope them black and install on the model.

The kingpost rigging assembly can be thrust into the pre-drilled holes. Spring tension will hold them in place.

"CONTROL MASTER"

presents

THEIR LATEST HARD TUBE RECEIVER



- Weight 1½ ozs.
- Flite Tested Six Months
- Use Your Favorite Relay
- Practically Indestructible
- One Pencell for Filaments
- 45 to 67½ Volts on Plate
- Any Antenna Length Over 18"
- 1½ to 2 ma. Drop with Signal

SEE IT AT YOUR FAVORITE DEALER

Model CM-3 PRICE ONLY $12.50 Including Tube

Made By

HOBBY ENTERPRISES, INC.

17 SECOND AVE. • BAY SHORE, N. Y.

STRONGEST GLUE IN AMERICA

Imagine—strength of up to 3600 lbs. per sq. inch on wood. So powerful it supports tons—yet so handy to use on the most fragile egg or delicate piece of china. Since 1879 Elwell's Glue has been used regularly by 18 of the top 37 Railroads, Schools, Manufacturers, in large lots. Now, for the first time, with Potentex added for extra strength, it is offered to you in small containers. Wonderful in home or shop for wood, furniture, fabrics, cloth, paper, leather, toys, glass, tiles, pottery, etc. Bonds fast. Not affected by climate. Always ready to use. Send only 25¢ coin now for generous container of Famous Dependable Elwell's Liquid Glue sent postpaid. (5 for $1 if you wish.)

ELWELL GLUE CO.

Dept. 22D **Gloucester, Mass.**

DEALERS!

Send for a free sample Copy of the hobby industry's leading trade magazine.

Packed full of information designed to help you sell more hobby merchandise.

CRAFT, MODEL & HOBBY INDUSTRY

30 E. 29th St. New York 16

Like to run trains?

Then you'll like . . .

MODEL TRAINS

. . . the monthly magazine that shows you the easy way to have more fun with all kinds of model trains.

Model Trains brings you track designs for O, O-27, S and HO; photos of other fellows' layouts; facts and photos on real railroads; plus articles on easy-to-make layouts, simplified wiring, ready-to-run scale equipment . . . everything to make model railroading easy and more fun.

SPECIAL OFFER

Get a 1/3 year's subscription to Model Trains PLUS this picture-packed book "Fun with Model Trains" that tells all about getting started in this fascinating hobby—a $1.55 value for only $1. This offer is limited, so mail the coupon with $1 today!

MODEL TRAINS, Milwaukee 3, Wis. Dept. 507-AN

Please send me the 32-page book "Fun with Model Trains" and the next four issues of MODEL TRAINS at the special price of $1. My $1 is enclosed.

Name _____

Street Address _____

City, Zone, State _____

A four bladed prop was used on the real ship and it looks real "gone" on the model.

The color scheme on the model was as follows: Khaki: Fuselage, fin and struts; Yellow: Wings, stabilizer, and elevators; Black: Guns, gunsight, gunring, exhaust stacks and kingposts; Silver: Wheel discs; White: Stripes and numerals; Red, White and Blue: Roundels and rudder stripes.

The all-balsa components, such as the fuselage, tail group and struts were given two to four coats of clear Aerogloss dope. These parts were lightly sanded and then Japanese silk covering was doped over them all. One half-inch wide silk strips were wrapped, bandage fashion, and doped around the cabane and landing gear struts. The wing frameworks were silk covered on one side. All parts were then given four to six coats of clear Aerogloss with the usual sanding at appropriate times.

The fuselage, fin and struts were given four coats of slightly thinned Aeroglass olive drab dope. The wings and tail took about seven or eight coats of unthinned Aerogloss yellow dope. After assembling the parts, the unfinished wing surfaces were covered and doped. All the insignia were then masked off and doped on.

Although a brush was used throughout (a spraygun is still a luxury around here), the finish turned out fairly well, especially the wings. Some evidences of wood grain may show through on the fuselage.

The author's model balanced off the drawing board at 1-1/2 in. aft of the upper wing leading edge. Add lead if necessary to make your ship balance at this point.

She sure looks good. Crank her up, buddy. You're on your own! END

Flash News

(*Continued from page 7*)

loaded weight and helps reduce vibration.

More luxury, too, on the way for transcontinental plane travel. The Super-G Connies (turbo-compound engines) will have three passenger compartments and a sumptuous lounge with couches, stationary seats, panorama windows, etc. Our own forecast—the prettiest stewardesses as well.

Quieter planes are ahead. Lockheed has a new prop synchronizing system that will probably reduce noise by 25 per cent. It's an electric and hydraulic affair to keep blades synchronized within a millionth of a second.

Substituting TAT for RAT isn't a gimmick. The Truck-Air-Truck idea in lieu of Rail-And-Truck will be pushed by Slick Airways to bring overnight service to metropolitan centers, provide transport of household articles at about the cost of surface carriage. Prices should run around $19.50 a hundredweight compared with $28 for regular airfreight. The more optimistic airfreighters point ahead to ton-mile operating costs as 15¢ to 16¢ on C-46's, 10¢ on DC-6A's, maybe 6¢ on C-130A's and as low as 3¢ on specially built turbo-prop cargo transports.

What's the outlook ahead in the aviation industry? Stability, a continued heavy production schedule. Here is how one recent conservative survey pictures it tersely: Manufacturing sales and profits about as last year. Trunk airlines face equipment, management, regulatory problems but may get fare boosts. Feeder lines stand a good chance of permanent certification contrasted to present temporary certificates. Straight air cargo operations—with a speed-up of the aerial pipeline—should show more profit. Defense spending on aviation equipment by June 30 will hit $9-billion, research another $1-billion; this spending to go on into next year. More and more people will use air, about 12 per cent more this year than last while rail coach and Pullman and intercity bus traffic will drop from 9 to 12 per cent.

But the aerial weapon business is passing

away from the airframe firms. Technical advances, new concepts, bring other concerns into the picture. The airplane is no longer the star of the show but just an actor on a complex aeronautical stage. Of 22 major aerial weapon systems, only nine are controlled by airframe companies; seven are being built by electronic outfits, four by universities and two by automobile manufacturers. A long-range hint from an authoritative source: less planes in the distant future but a tremendous expansion in the other types of aerial weapons.

Eighty miles up! That's the exploratory altitude a new, cheap rocket can penetrate. Developed by an institute associated with U. of Michigan, the 8-ft. long, 220 lb. missile can be made for about $15,000. This compares with former costs of $100,000 for a rocket to explore such height. The new rocket can be carried to a high altitude by anti-aircraft missiles; thereafter, go on its own. The drop starts at about 80 miles, electronic devices radioing back to earth the vital information on density, temperature of air, magnetic activity and other factors wanted for research.

Watch the blimps go by—could be a new Navy saying. Goodyear will build more non-rigid airships, the ZPG-2W, for the early warning system. The new blimp is a sister (or brother, perhaps) to the ZPG-2 which set a 200-hour endurance record—sustained flight without refueling—last year. The new, 70-knot job will be 343 ft. long, inflated with 975,000 cu. ft. of helium, have two Wright R1300 piston engines.

British missiles are not too far behind U. S. development. Their electric homing devices may actually be better. Some use photocells sensitive to infra-red rays generated by heat of an enemy plane. Some seek not only heat but magnetic radiation from an enemy's fuselage or electronic gear. Some even sense and locate sound, such as the wake of planes or missiles, home accurately on such intangibiles. But they'll home on friendly planes as well as enemy ones. Trouble is, they cannot distinguish between friend or foe. Maybe some day they'll think, too.

What Washington aviation writers gossip about: NACA's materials test reactor to find the suitability of new types of fuels, coolants, materials, etc. for atomic aircraft engines... The critical stage reached by AF manpower with 60 per cent of airmen leaving AF at end of first four-year hitch... The growing shortage of aircraft scientists and industry's plans to offer up in the thousands of scholarships... The school for agricultural pilots to open in October at Texas A and M (six weeks, 30 hrs. of flight training, room and board, about $500 per student)... The Navajo long-range navigation system to be built at Camden, N. Y. to guide planes 2,500 to 3,000 miles in all directions. END

Flapping Wings

(*Continued from page* 17)

to air pressure, and in so doing serve to produce forward thrust. Large buzzards have been photographed while making the transition from soaring to power-on flight (wherein the tip feathers change function) by Dr. Raspet and associates at the Mississippi State College research station. Dr. Raspet's pictures, taken from a sailplane used by the physicist to trail the birds, clearly show the primary feather action as the birds "get in gear."

The body of a bird in steady flight undulates only slightly as the wings beat. This is made possible by the variable-incidence feature of a bird's inner wing, which provides a relatively constant angle of attack and thereby maintains lift throughout the stroke cycle. Though propulsion is derived mainly from the wing tips, and lift from the inner wing, efficiency demands use of the full leverage available and so the entire wing moves on each stroke. We cannot readily measure the forces on a bird's wing nor plot the rapid changes in wing geometry as precisely as we would like, but we do know that birds are remarkably efficient, whether migrating across oceans or soaring above cornfields. Consider a soaring buzzard, operating at a Reynold's number not too much higher than that of a Class C gas model. Despite its considerably higher wing loading, the buzzard exhibits a lower sinking speed than that of the model. The secret is in the bird's surprisingly low over-all drag coefficient and in its correspondingly high lift-drag ratio. Just how the bird achieves this is not definitely known, but researchers have reason to suspect that the answer lies in some form of boundary layer control. And so we find that a most promising new aspect of full scale aerodynamics is old, old stuff to our feathered friends.

Early Ornithopters

Of all those noted for their work with ornithopters, Leonardo Da Vinci and the young French genius, Alphonse Penaud, deserve lasting recognition. The brilliant Da Vinci designed some remarkable ornithopters after studying the anatomy and the flight of birds. Several centuries later, Penaud built the first really successful flying model flapper and we still use his basic layout today. Some of the French ornithopters of Penaud's time (the 1870's) employed clever arrangements of links and levers to move their wings in a realistic bird-like manner. A model of this type may be seen in the National Air Museum in Washington, D. C. We also must credit Penaud with the introduction of twisted rubber strands as a source of power and with the conception of the basic aerodynamic layout used by all conventional model airplanes.

Modern Experiments

During the 1930's Dr. Alexander Lippisch, an aeronautical scientist who is known chiefly for his pioneering work with deltas, swept wings, and rocket-powered craft while in Germany, conducted experiments with models employing oscillating vanes and flapping wingtips

WIN THIS $5000 CADILLAC!

Somebody Will Win It! Why Not You?

Enter the

MONOGRAM

Cadillac Contest

10 Fabulous Prizes

1. $5000 Cadillac Coupe de Ville
2. $1000 U. S. Saving Bond
3. $500 U. S. Saving Bond
4 to 10. $100 U. S. Saving Bond

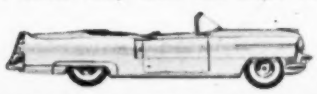
Contest Closes July 31st

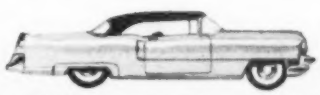
First place winner gets this $5000 Cadillac Coupe de Ville. The real 1955 Cadillac from which the Coupe de Ville model below was copied.

Everyone Can Enter

You Do Not Have to Build a Model! Just Follow Simple Rules!

Yes, sir! For FREE too! Somebody will win this most beautiful car and the nine big savings bond prizes too. Why not you? It's so easy. Here's all you have to do. Go to your nearest hobby shop or other store. See the magnificent new Monogram Cadillac model kits and the gorgeous 11¼ inch completed model on display. Read the official contest entry blank and simple rules packed in each kit. Note that you don't have to build a model for this is not a model building contest. Just finish this sentence — "I like the Monogram all-plastic Cadillac model because —" That's all! Hurry to your store now. Take mother and dad along. Let them help you win a glamorous $5000 Cadillac.



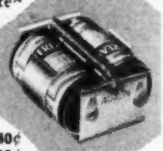


Monogram's magnificent Cadillac models are made under authorization and control of General Motors. Kit P4 • Cadillac Convertible. Kit P5 • Cadillac Coupe de Ville. Each $2.95.

Monogram Models INC ★ 3421 West 48th Place • Chicago 32

GET SUPERformance with AUSTIN-CRAFT ACCESSORIES!

A-C BATTERY BOXES For electric, gas-powered, radio-controlled model boats, planes, or cars. Positive crash-proof contacts. New lugs for easy soldering. Can be balance adjusted outside of model.



Pencell (2 pencells) . . . . ea. 40¢
3-Volt (4 pencells) . . . . . ea. 60¢
6-Volt (4 pencells) . . . . . ea. 75¢
Medium (2 med. cells) . . ea. 40¢
Large (2 large cells) . . . . ea. 40¢
22½-Volt Single Cell . . . ea. 40¢
Twin Cells . . . . . 50¢

NEW A-C PUMPS Die-cast, dependable, built to last.
½ pt. or pint. ea. 65¢
½ pt. or pint with screen filter . . . . . ea. 69¢
Quart, with screen filter . . ea. 75¢

A-C WRENCHES
Compact, easy-handling design. Fits all plugs, protects porcelain, cylinders.
4-Way Socket Wrench . . 60¢
Flat Wrench . . 25¢

AUSTIN Craft
431 S. VICTORY BLVD., BURBANK, CALIF.

as their source of propulsion. Lift was provided by fixed wings, in the manner of a conventional airplane. Both rubber-powered and gas engine-powered craft were turned out under the direction of Dr. Lippisch, and very good flight results were obtained. Many of these models used the same propulsive system, a single pair of oscillating vanes that was used successfully by Australian modeler Hargraves, on a compressed-air model back in 1891. America's own William B. Stout, famed designer of the Ford Trimotor and many aeronautical and automotive innovations, has taken a great interest in flapping-wing research in recent years. In his Arizona laboratory Stout tested a great variety of wing shapes and drive mechanisms, using a whirl-stand in place of a wind tunnel. Stout has suggested that flapping wings offer much promise as a means of achieving safe, inexpensive low-speed and hovering flight, and improved maneuverability. Whether such craft as he envisions can ever reach a useful state of development will not be known until flapping wings have had their share of modern research.

Ornithopters caught on about 1936 when indoor builders, finding their skill at producing efficient structures well suited to this field, began dusting the rafters with high-performance flappers. In Chicago, where the unforgettable Aeronuts competed among themselves, Lidgard, Bock, Turner and Goldberg all surpassed three minutes indoors, and Carl's AMA record of 4:05 still stands. The Aeronut's indoor craft established what has come to be known as the American school of ornithopter design. This type of model has its single pair of wings hinged at the root, each flapper acting as a single large feather near its tip and as a flat-plate airfoil near the root. At the trailing edge the flexible covering is free to lag the flapping motion of the spar, and so undergoes the same gross pitch change as does a bird's primary feathers. While the bird's complex wing motion is reduced to simple reciprocating motion on the flapper, the effect of the former is obtained by flying the model at a high angle of attack.

In a sense, bats and insects fly with the same simplified wings as are to be found on our flappers. Our models are not entomopters (insect-wing craft), however, as the latter have two pairs of wings, small and fast-beating by comparison. But regardless of whether it most resembles bat, bug, or bird, the Chicago ornithopter configuration unmistakably supports and propels itself by flapping its entire wing area, feathered or not.

The model ornithopter is admittedly still inefficient by comparison with other models. That it has attained such durations as four minutes indoors and two minutes outdoors (sans thermals) is a tribute to the skill of builders in bringing wing-loadings down and packing in plenty of power. Much greater efficiencies are to be expected in the future, both for rubber and power-driven ornithopters. This progress, mostly through the improvement of ornithopter aerodynamics, will be slow in coming, for all of the easy work is done. We can improve the geometry of the flapper strokes. Lift and drag characteristics of the entire wing can certainly be bettered; perhaps a good start would be to split the tips into high aspect ratio sections like primary feathers, and obtain true pitch with these surfaces. But we must remember that every addition or change to a design must "pay its own way" and a little besides, if it is to be a genuine improvement. When we add mechanical or aerodynamic complexities to our flappers, we must give full attention to the effects of the added weight and any increase in friction losses—the invisible but potent enemies of efficiency. Bill Stout put it all in a nutshell for us with his famous dictum to aircraft designers: "Simplicate and add more lightness."

Currently popular among flapping-wing enthusiasts are the familiar American-style ornithopters, the White Dragonfly and the semi-ornithopters in the Lippisch-Von Holst-

THIMBLE-DROME

Holder of more speed and performance records than any other ½A equipment!

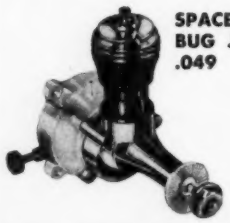
Engines that really start—equipment that really works—accessories that really boost performance—this is what you get from Thimble Drome. Ask any experienced modeler and he'll tell you that in ½A—control line, free flight, championship, sport, or beginning flying—your first choice is Thimble Drome!

Your dealer has these items. If temporarily out of stock, he will be glad to get any of them for you. He knows that a Thimble Drome customer means a satisfied customer for him. So, if you want the BEST in ½A, just ask him for—Thimble Drome equipment!

SPACE BUG .049

Contest. Superior to any ½A engine (Thermal Hopper excepted)—in power, speed, easy starting, and long life. National ½A Champion!

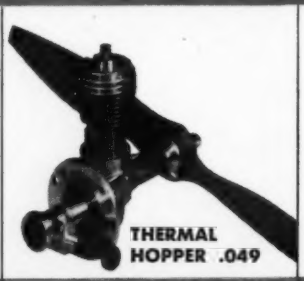
6.95



SPACE BUG JR. .049

For Average ½A Sport Use. World's easiest starting ½A engine! No break-in needed. Just flip it over and fly! Sensational value.

4.95



THERMAL HOPPER .049

Contest. Free flight, Speed, Clipper Cargo. New multi-jet carburetor delivers max. performance under varying flight conditions. Less tank.

6.95

STRATO BUG .049

Advanced Sport and Stunt. Exceptionally smooth in operation. Almost as hot as "Space Bug." A good high performance value.

5.95

L. M. COX MANUFACTURING CO., INC. P. O. BOX 476, SANTA ANA, CALIFORNIA

new
COMPANION TO THE POPULAR RASCAL!
Modern Navy prop-jet design for ½A gas engines. Famous Jigtime construction gives easy "no mistake" assembly. Switches in a jiffy from free flight to control line!
KIT G-7 $2.50
NAVY
DESIGNED BY CARL GOLDBERG
ARROWJET • 24
TOP FLITE
RASCAL • 27
FORMERLY 'LIL RASCAL
The long time favorite for ½A gas engines. Free flight and control line! Typical Jigtime construction; rugged, easy to build and fly. Look for Rascal's bright new box; 3 colors, lustrously varnished.
KIT G-5 $1.95
TOP FLITE MODELS, INC. • 2639 SOUTH WABASH AVE. • CHICAGO 16, ILLINOIS

Hargraves tradition. Undoubtedly the leading exponent of the latter type is that inveterate experimenter from Iowa, Lawrence Conover. His large tip-flapper was flown at the 1953 Nationals and at the recent Glenview Nationals, two of Larry's models could be seen flitting about in the large workshop hangar with all the aplomb of a pair of pigeons. Across the Atlantic, where the more difficult unorthodox model types never fail to receive their share of attention, a rarely-attempted approach to ornithopter design has met with great success. The brainchild of John White, this design is a "biplane" ornithopter with the flappers so phased as to produce an even flow of thrust and very little forward fuselage vibration. Probably this model flies more smoothly than the tandem dragonfly layouts which have been tried previously in an effort to dampen the crank reaction. In this country, perhaps the most highly developed outdoor ornithopters are the 200 sq. in. models of the Flaphappy series, which have held the duration record almost continuously since 1946. These large flappers grew out of the experience gained from the dozens of smaller indoor and outdoor ornithopters which the author and his brother built prior to World War II.

Snappy: Construction and Flight Adjustments

It is important that wood of the proper density be selected for each part, as the ornithopter structure must be light, yet sturdy enough to withstand the severe load reversals. Note the density coding beside each dimension. Assembling the cabane section is a little tricky and the builder may choose to make a simple jig to hold the struts in place while the center panel is added. Check the alinement of this section with a draftsman's triangle and don't forget the overhang at the front. When the first cement application is dry, follow with several additional coats, applied thin and wiped away from the joints to form a long thin fillet. The flapper spars are laminated of light, flexible balsa that has been preformed by soaking in hot water and then pinning to a sheet balsa form until dry. Cover the wings carefully, as both surfaces must have equal tautness; otherwise, the model will tend to circle too tightly. For best performance, replace the Silkspan whenever it becomes limp. Small white cracks in the covering indicate that the fibers are parting as a result of fatigue. If the covering is used too long, it may rip suddenly under power and the result of such an unbalanced load is always the same: one ornithopter rapidly shaken to pieces. Inspect the structure after every flight on full turns.

This ship flies slowly and at a high angle of attack, which gives one the impression that it is stalling. Launches must be gentle, particularly in the face of a breeze. Do not alter the built-in stabilizer setting as shown on the plans until you have made at least a dozen hand-wound flights in order to familiarize yourself with the general flying characteristics. Using the motor shown on the plans, work up to about 100 or 110 hand turns. Provided your model weighs in at 1.0 to 1.1 oz., it should climb to 30 ft. or more and turn in flights of 25 to 35 seconds on these turns.

Landings should be dead stick. If the model seems to stall and swoop excessively, or fails to match the above performance, try about 1/32 in. of shim at the top of the tail boom and fuselage juncture. The initial stalling and spiral tendencies are the things to concentrate on, for the model is capable of climbing quite steeply, if properly trimmed and powered. Using a heavier competition-type motor, climbs of 75 to 100 ft. have been made with Snappy and with its predecessors. Once aloft, this model will cruise about with very little effort—as little as one beat per second. The glide is often mushy, but the rate of descent is low and the flapper's low forward speed gives it ability to hook onto small risers. END

THERE'S MORE
GO
WITH A
GO JET!
The GO-JET is a specially designed needle valve, for ALL model internal combustion engines, to give added CARBURETION CONTROL.
The GO-JET will give you better performance—a smoother running engine, longer flights—more efficient use of fuel, and easier starts—fuel is more easily drawn into engine. Aside from these advantages the GO-JET makes it possible to have both the control needle and the fuel line on the same side of engine thus eliminating kinked fuel lines. There are two sizes to fit engines ranging from .09 to .15 and from .19 to .60. They are adaptable to all makes. Easy to install you can improve the performance of your favorite engine in a few minutes.
85¢
Complete with Self Tapping Screw and Plug.
P. O. BOX 484
COMPTON, CALIF.

M.E.W. 307 JET ENGINE

$11.45 Prepaid

3 lbs.
Static Thrust

MOST THRUST PER DOLLAR

MINNESOTA ENGINE WORKS, INC.
5600 N. HAMLINE AVE.
ST. PAUL 12, MINN.

YOUR CHOICE

ANY **6** PLAN SETS **$1**

ALL **12** SETS FOR **$2**

You bet, here's a real buy! Any 6 sets of the plans listed below sent to you postpaid for only $1. Or if you wish, the entire set of 12, consisting of 26 plans in all, may be had for the bargain price of $2 postpaid. Check the sets that you are interested in and mail your order in today while they are available.

☐ THE SPACER: Class AB free flight.
STUMPY: .09 combat U-control.

☐ SNIPE: Half-A stunt.
STRATOHAWK: Limited rubber.

☐ SMARTIE: .29 - .35 stunt bipe.
PENNY: Outboard boat.
LI'L SPEED MERCHANT: .049 speed.

☐ SHOEHORN: .049 flying boat.
ALKIE IV: .049 free flight.
QUICK 60: CD speed.

☐ SHEIK: .29 team racer.
DRIFTWOOD: .049 free flight.

☐ SPOOKY: .09 stunter.
SLOWPOKE: .09 sport free flight.

☐ BOUNDER: Record .29 speed.
ZEPHYR: .049 free flight.

☐ NOBLER: Aldrich .29 stunt.
FUNSTER: Hot .049 free flight.

☐ SKY WING: .049 flying wing.
CHALLENGER: .29 team racer.

☐ HOTTER 'N THAT: .29 combat.
SUPER SAUCER: Large towliner.

☐ BEAVER: .19 - .35 scale.
ZENITH: Taibi A free flight.

☐ HALF WILD GOOSE: .049 free flight.
FIRECRACKER: .29 scale.

MODEL AIRPLANE NEWS
551 Fifth Ave., New York 17, N. Y.

Enclosed is.....for which send me postpaid the sets of plans which I have checked.

Name (Please print)

Address

City Zone State

the Canned DUCT

(*Continued from page* 13)

as possible. Don't go oversize on the No. 32 drill stop holes at the blade roots. Also, don't misplace them. It will only take an hour or so to make a new fan if you goof, so don't use a fan that is not right! After blanking out the fan, twist the blades to 45° and file the airfoil contour. (This is important, since it reduces stresses by cutting down weight). Then twist the tips down to 30°, holding the blades by their roots so the root angle remains at 45°. Check the angles carefully, and try to keep them within 2°. The angles specified are easy to check; it is suggested that the fan be set up on a spool of thread on a flat surface in strong light and the angles checked with drafting triangles. Check the fan for proper tracking when you finish setting the angles. Don't bend the blades back and forth any more than you can help: fatigue cracking may start at the roots. Cement a 1.5-in. diameter notched balsa spinner to the fan, as shown in the diagram.

When working on the mount or nacelle after the bottom of the can has been cut out, put the fan on the engine and insert shims between the blade tips and the can to preserve alinement and roundness.

One last word of advice: keep the duct inside as "clean" as possible. The airspeed through the duct is about 50 mph, so that drag is more important inside the duct than outside. If you fly in a dirty area, you will find that the duct gets full of dirt, mud or grass, so that an occasional bath is in order. Well, that's all there is. Good luck—or, if you're careful so that you don't need luck—best wishes! END

Barnstormer Bipe . . .

(*Continued from page* 24)

only. First of all, for successful flying, the controls must work easily and the wheels move freely. Note that the motor is offset to the right and the rear edge of the rudder is also angled to keep the model pulling toward the outside of the circle. Another trick that is helpful in maintaining taut lines on small ships of this type is to weight the outside wing tip (lower) with a small piece of solder (about 1/8 oz.).

The actual construction should be started by cutting out the wood parts, using the full size parts as templates. Round off the fuselage (A) edges with sandpaper, except at the points at which the flying surfaces attach. Sandwich the landing gear and C filler between the B firewall pieces, then attach the firewall-landing gear assembly to the fuselage. Carve the four engine pod pieces to the shape shown on the plan and install the 1/16 in. aluminum bellcrank (D) to the fuselage. Next, cement the engine pod pieces in position. Cut pieces of black tissue to the cabin pattern and dope them to the fuselage.

The wings (E and F) and tail surfaces (G and H) are formed in the usual manner, with the upper surfaces being sanded to the airfoil sections. Note that the wing slots must be angled to accommodate the struts correctly. Join the two rudder pieces (I and J) flat on the building board and round off the edges (except at the bottom). Make the elevator hinges from 1/4 in. wide pieces of cloth, nylon or bandage and check carefully that the elevator moves up and down freely.

Cement the wings, stabilizer and rudder in position, using plenty of cement, checking that the shrinking action of the cement does not pull them out of line. Now add the wing struts (K). Install the elevator horn (L), pushrod and lead-out wires. Note that the latter pass through the plywood line guide (M), which is cemented to the inside wing strut.

As lightness is of primary importance, the model should *not* be color-doped. Give the entire ship several coats of clear dope and sand lightly between coats with very fine sandpaper (preferably No. 2-80 wet or dry type). Attractive colors can be made by adding analine dyes to clear dope while decals will add to the appearance of the finished ship, without adding excessive weight. To eliminate the chances of the dope warping the flying surfaces, plasticize the dope before use with a few drops of castor oil.

Use a fuelproof dope (Butyrate) or, if a regular dope finish has been applied, give the entire ship a coat of fuelproofer. Be careful not to get the fuelproofer on the control mechanism or on the engine as it will gum up the system. Attach 30-ft. lines to the lead-out wires and your Barnstormer Bipe is ready for its first check-out. Typical ready-to-fly weight for this design should work out at around the 4 oz. mark. END

Import Review

(*Continued from page* 27)

the compressed air escapes. That is precision workmanship where it counts and it is a standard maintained throughout in the Mills engines.

The 1.3 now comes equipped with a variable speed throttle that really works reliably down to a fast idle and is operated by a lever with a return spring. Unfortunately, throttle operation involves twisting of the fuel line, as the whole jet assembly moves with the throttle, and this requires a certain amount of effort—considerably more than the return spring can supply. Coupling of the control to an operating mechanism will therefore require some ingenuity, but once working, it will amply repay the effort.

Let us close this very brief review of a fine engine by sincerely advising anyone, who wishes to enter the Diesel field, with the minimum of frustration and heartache, first to consider the Mills 1.3 very seriously before rushing into getting a hot temperamental fireater, and to those who lean toward small radio jobs, this engine may be your ideal.

World Engines, P.O. Box 905, *Warren, Ohio*

Mills .75 cc Diesel (.045)

The baby of the Mills family is the counterpart of the 1.3 in the Half-A class and has all the virtues of the larger engine with the addition of a fuel tank, and a cut-out instead of a throttle. Its performance in relation to glow jobs of similar size is very satisfactory and the weight of 1-3/4 oz. is reasonable.

The construction differs from the 1.3 in several respects and is largely responsible for the reduced weight displacement ratio. However, their effects upon cylinder clamping loads and similar considerations make little difference to the stresses inside the engine, so that, for all practical purposes, the design is the same and everything said about the 1.3 applies equally well to the .75, and if the Half-A class is your favorite, this engine has all the renowned Mills features made to suit.

World Engines, P.O. Box 905, *Warren, Ohio*

Taifun Tornado 2.5 cc Diesel (.15)

The Tornado is generally similar to the Rasant 2.5 described last month, but with the important difference of having a twin ball bearing crankshaft and a sturdier crankcase with larger beam mounting lugs. All the highly stressed parts of the engine such as crank, conrod, cylinder and piston are stronger and the bore has been increased and the stroke shortened with modified port timing and areas to suit. A larger diameter prop driver and spinner nut handle the increased power, and the front rotary induction system is supplemented by a larger amount of sub-piston opening. All these increases in structural strength are accomplished for a weight of just under 4-1/2 oz. and the whole engine forms a perfect illustration of the measures necessary for trans-

forming an average design into a racing engine of outstanding maximum power, for that is our verdict on the Tornado, and from the dimensions and materials employed, it may be expected to maintain that performance for a very long time.

The engine may be easily distinguished from its plain bearing counterpart by the red anodised head and spinner, and in common with all the Taifuns it comes in a neat box complete with test block, bar wrench, fuel tubing and very comprehensive instructions in several languages which will double for a modelling language dictionary for those with pen pals.

Wilshire Model Center, 1326 Wilshire Blvd., Santa Monica, Calif.

OS Max-1 .35

The O.S. .35 is a Japanese bomb and its shock wave is going to be felt on many a contest field. It is one of the hottest .35's yet tested and one of the best looking. The port areas are enormous, as might be expected, with an intake fit for a .60, but two sizes of intake reducers are supplied for more suction at low speeds. Pleasing features are the bronze conrod bushings and a bronze plug insert cast in the head. All castings are very clean and well finished, and the nickel plated needle valve assembly with spring locking device, spring extension and curved fuel tube connector is especially noteworthy. In general, the layout is similar to the K & B .35, its chief competitor, but with a little more attention lavished on appearance.

Taking standard American long reach plugs, with American threads throughout, this is a serious contender for popularity in its class.

World Engines, P.O. Box 905, Warren, Ohio

Elfin 1.49 B.R. Diesel (.09)

Let us start this on firm ground by saying that the finish and workmanship on some examples of earlier Elfin designs has not always been exemplary, and it is extraordinary how stories of such shortcomings get around, so it is almost like a new statement of policy when you see into the inside of this brand new engine from the Elfin stable, because everything is first class from the casting up.

Looking back, one realizes that every new engine from Elfin has sparked a minor revolution on the drawing boards of the European branch of the model engine industry and we predict that this new job will do the same, for it has an absolutely functional and practical new look along with some solutions to problems of detail that many will regard as "the answer." Above all, this engine goes like nothing else we've seen with ether in the fuel, and on top of that, it starts easily and pulls large props almost as efficiently as small.

With a double ball bearing crank, very sturdy piston and cylinder, large radial ports and reed valve induction, it has all the things in one package that have over the years proved themselves separately in many engines, and their combination in an engine of .09 displacement has led the designer to make his crankcase the same diameter from backplate to prop driver, with lightness achieved by coring the unnecessary metal out of the casting. The result is the strongest and most rigid main bearing and cylinder anchorage in production, and allows the mounting lugs to be positioned around the mid-point of the engine length, with considerably less leverage on the mounts in the event of a crash, and less vibration from unbalanced props with more usable power available and less wear and tear on the model.

The reed valve is held on its seat by a spring and snap ring inside the crankcase rear cover, which is screwed into the casting, and the intake emerges from the center of the rear cover by means of threads and locknut, so that it can be rotated to suit the installation.

COMET CEMENT & DOPE

The BIGGEST VALUES in their FIELD

10¢

There are two simple reasons why sales of COMET DOPE and COMET CEMENT go up—up—UP: you can't top the quality—you can't beat the value! There's a COMET CEMENT for every purpose: Regular, Extra Fast Drying, and COMET CEMENT for PLASTICS—all big tubes at only 10c each! (Cement for Plastics in a jar, too—same big value for a dime!) Comet Cements take hold quickly—grip tight—do a better job in less time! COMET DOPE covers like no other, flows on smoothly, dries quickly, has remarkable resistance to separation and hardening.

A FULL RANGE OF BRILLIANT COLORS

Insignia Blue, Insignia Red, Aeronca Orange, Taylorcraft Yellow, Regal Maroon, Rich Gold, Silver, Aircraft Cream, Gloss Top Coat, Stinson Green, Horizon Blue, Insignia White, Jet Black, Battleship Grey, Sanding Sealer, Thinner, Clear, Chocolate Brown, Olive Drab

Each in a big jar for only 10c

NEW! COMET'S "SET-OF-SEVEN" HY-GLOSS PAINTS FOR PLASTICS

7 Jars in container—69c complete

DRIES TO THE TOUCH IN 5 MINUTES . . . THOROUGHLY DRY IN 20 MINUTES! One coat covers! 7 big jars . . . chart tells how to mix many shades and tones. For plastic construction toys, household articles, wood, metal, ceramics; touching up autos, refrigerators, bikes, etc.

also 10c tubes in 14 sparkling colors

Dark Blue • Red • Orange • Yellow • Green • Sky Blue • White • Jet Black • Gray • Silver • Choc. Brown • Olive Drab • Gold • Thinner

Comet's All-Plastic High-Impact Control Gas Model

Sabre 44

$9.95

A sensational plastic model, complete with engine, ready-to-fly! Strikingly packaged in 3-color protective case.

Complete with powerful ½A Herkimer 049B Gas Engine

COMET MODEL HOBBYCRAFT, INC.
501 West 35th Street • Chicago 16, Illinois

FIVE CHANNEL EQUIVALENT
Any Receiver & Transmitter!

RUDDER, ELEVATOR AND THREE OTHER CONTROL CIRCUITS!
NO SEQUENCE TO REMEMBER!

RAPID-PULSE Stick Controller

BE FIRST WITH THE FINEST

Coil circuit drain guaranteed less than 160 mils. at 3 volts.

MULTITROL Escapement pat. pend.

For TOP Performance—Get POSI-TAC, The battery box designed for R.C.

Pen Cell $1.00 Med. Cell $1.25 Holds 4 cells

WRITE for full information.

BOTH ONLY $32.95

Satisfaction or money refunded
25% deposit on C.O.D.

ECTRON PRODUCTS CO.
Box 393 Smyrna, Ga.

ACE ★ STAR 17" PREFAB RACING SLOOP

A sleek operating model, completely prefabricated, easy-to-build Ace kit. A sturdy balsa hull with die-cut parts, streamlined keel, 21" birch mast, hemmed sails of fine grade muslin, rudder, all necessary top quality rigging and fittings. Only $3.50 at your dealer! Made by Ace Products, Pasadena, Calif.

ALLBON MERLIN

DISPLACEMENT: .046 cu. ins.
B.H.P.: .075 @ 13000 r.p.m.
BARE WEIGHT: 1¾ ozs.
MOUNTING: beam or radial

only $6.95

Newest addition to the Allbon Range, the "Merlin," true to family tradition, has been engineered to last a modelling lifetime. Sound in design, and of rugged construction, this well-mannered powerful diesel will demonstrate its superiority in coming ½A competitions.

E.D. 2.46 C.C.
"RACER"
.26 H.P. @ 14000 R.P.M.
only $11.95

An outstanding performer, no less than 12 international records fell to the "RACER" during 1954. Now on sale at a new low price, this ball bearing diesel is a bargain you can't afford to miss!

These engines are completely guaranteed. All parts and repair service are available through us in Canada. If your dealer does not stock them, you may order direct from us. Enclose money order, cheque, or $1.00 with C.O.D. We pay postage.

CANADIAN MODEL SUPPLIES
P.O. Box 258, Stn. H, Toronto, Ontario

The whole engine with its phenomenal performance and exciting appearance is yet another step forward in the apparently endless search for more steam from fewer cubic inches.

World Engines, P.O. Box 905, Warren, Ohio

Taifun Hobby .98 Diesel (.06)

The Taifun Hobby is virtually a miniature of the Taifun Rasant described last month, having the same appearance and bypass system and the same high standard of workmanship.

Of main interest to those requiring something midway between .049 and .099, it is very sturdily constructed for its size, weighing just over 2 oz., and has good man-sized controls that will not burn your fingers. Performance is average, but smooth and consistent with a good power output at low speeds, and excellent starting hot or cold. As with the Rasant a minor criticism concerns the small diameter of the prop driver in proportion to the power, but apart from this the Hobby seems to be a very sound little engine in every respect.

Wilshire Model Center, 1326 Wilshire Blvd., Santa Monica, Calif. END

Contest Calendar

JUNE

4 & 5—*Goodland, Kan.:* Class AA Northwest Kansas Gashoppers' Meet for FFG, CLFS, CLS, combat, RC, CL. Kenneth Armstrong, C.D., Goodland, Kan.

4 & 5—*Albuquerque, N. M.:* Class AA 1st Annual Sky Harbor Hobby Shop Contest for CL, CLFS, CLS, combat, TR, FFG, OR, TLG, RC. James P. Taylor, C.D., c/o Sky Harbor Model Shop, 1313 San Mateo, N. E., Albuquerque, N. M.

5—*Farmingdale, N. Y.:* Class AA 2nd Annual Long Island Industrial Championships for CL, CLS, combat, NC, beauty. Arthur F. Wardell, C. D., 2 Hunt Place, Bethpage, N. Y.

5—*El Paso, Tex.:* Record Trials for FFG, OR, TLG, OHLG. Fred Lind, C. D., 1610 E. Yardell, El Paso, Tex.

5—*Fall River, Mass.:* Pending.

5—*Chicago:* Class AA Chicago U-Liners' Annual Meet for combat. Edgar M. Holzbach, C. D., 14510 S. Union Ave., Chicago 27.

5—*Wilmington, Del.:* Class AA 5th Annual Exchange Club Model Airplane Meet for CL, CLS, beauty, combat, TR, ½A FFG, RC. G. B. Schmutz, C. D., 845 Tatnall St., Wilmington, Del.

5—*Los Alamitos, Calif.:* Inglewood Flightmasters' Monthly Record Trials for all outdoor free flight but ROW. Robert E. Moncrieff, C. D., 2108 Santa Fe Ave., Torrance, Calif.

5—*Inglewood, Calif.:* Skywolves' Record Trials for CL. Similar Record Trials also on July 3. Don C. Crystal, C. D., 805 E. Palmer Ave., Compton, Calif.

5—*White Plains, N. Y.:* Contest for FFG, RC, CLS, beauty, scale, TR, combat, OHLG, CL, helicopter, PL, CC. A. E. Lehmberg, C. D., North Salem Rd., Ridgefield, Conn. Pending.

11 & 12—*Marysville, Calif.:* 6th Marysville Annual Contest for FFG, PL. Frank Hauser, C.D., 517 Fruitvale, Yuba City, Calif. Pending.

12—*Ft. Wayne, Ind.:* Class AA Mad Modelers' Meet for FFG, CLS, combat, CLFS, RC. Walter A. Krull, C. D., 414 E. Washington, Ft. Wayne 2, Ind.

12—*Ft. Worth, Tex.:* Cowtown Sahibs' Record Trials for all outdoor events. Similar Record Trials also on July 10, Aug. 14, Sept. 11, Oct. 9, Nov. 13, Dec. 11. Ralph Tenny, C. D., 608 W. Prairie, Arlington, Tex.

12—*Corning, N. Y.:* Class AA 2nd Annual Flying Sparks' Radio Control Meet. W. E.

ESPECIALLY FOR R-C!

Powerful, Easy Starting

TWO-SPEED TIMER IS STANDARD EQUIPMENT

YOU CAN'T BEAT IT FOR PERFORMANCE!
TRADE IN YOUR OLD ENGINE WITH US!
write for full particulars
FORSTER BROTHERS
7 E. LANARK AVE., LANARK, ILL.

Super Detail
World War I
½ INCH SCALE FLYING MODELS
DESIGNED FOR CAMPUS CO2 OR RUBBER POWER

SOPWITH CAMEL
SPAN 14" $1.00

OTHERS AVAILABLE IN THIS SERIES

S E 5 A	SPAN 13 5/16" $1.00	ASK YOUR DEALER FIRST
FOKKER DRI	SPAN 11 3/4" $1.00	

If Ordered Direct Please Add 10c Postage

CARTER CRAFT MODELS
16 MONTICELLO ARCADE NORFOLK 10, VIRGINIA

Maico has IT!

JAPANESE TISSUE: Direct from the mill. Better than pre-war STANDARD 6¢ (20 for $1.00). SUPERFINE 10¢ (25 for $2.00). Colors: Red, Yellow, White, Orange, Blue. Min. order $2.00. Cover dry, water spray, 2 thin dopes.

R/C AIR WHEELS: Large air volume, Pure, bouncy rubber. Factory inflated. Maple hubs. Brass Bushings. Price per pair. Singles half.

2½" dia.....$1.25 3" dia.....$1.40
2⅝" dia.....$1.40 3½" dia.....$1.50
SPECIAL: 3½" dia.—DURAL HUB $2.25 per pair

R/C WING/STAB KITS. Many in use as Wing/Stab replacements. And on original fuselages. Clark Y die-cut ribs. Formed and notched edges.
42" Sp. x 7" Cd..$1.75 60" Sp. x 10" Cd..$3.50
50" Sp. x 9" Cd..$2.50 (Stab Area to suit Wing)

T-56 RUBBER. For Wakefields and Limited. ¼ Width, 3¢ per ft. (Minimum order 25 ft.)
SAFE WINDING HOOK. Place in chuck.....$.50
5-1 R/C WINDER. Long winding extension..$1.00
"BABY" ELMIC TIMERS. 1/5 oz. wt.....$1.00
1951-52 and 1953 YEAR BOOKS.....$1.00 each

NOTE: These items have a very limited distribution, and your dealer might not have them in stock. If so, please order direct. We pay postage.

MODEL AIRCRAFT CO.
Box 333, Sta. D • New York 3, N. Y.

Bliss, C. D., 47 Corning Blvd., Corning, N. Y.

12—*Inglewood, Calif.:* Class AA Skywolves' Team Race. Similar meets also on July 10, Sept. 11, Nov. 13. Don C. Crystal, C. D., 805 E. Palmer Ave., Compton, Calif.

12—*Easton, Pa.:* Class AA Model Airplane Doctors' 3rd Annual Air Meet for FFG, combat, OR, CLS, RC, TLG, CL. Russ R. Sottosanti, C. D., 113 Keane St., Easton, Pa.

12—*Hartford, Conn.:* Class AA Greater Hartford Spring Team Race. Richard Matava, C. D., 358 Prospect Ave., Hartford, Conn.

12—*Cedar Rapids, Ia.:* Class AAA 10th Annual John Pavlis Memorial Model Airplane Contest for FFG, FFFS, TLG, OHLG, OR, RC. Paul M. Marchal, Jr., C. D., 1837 8th Ave., S. W., Cedar Rapids, Ia.

12—*Milan, Mich.:* Class AA Milan Aeromodelers' 1st Annual Model Meet for FFG, CLS, combat, RC. David R. Maricle, C. D., 148 W. Main, Milan, Mich.

12—*Moses Lake, Wash.:* Class AA 1st Annual Columbia Basin Model Meet for FFG, FFFS, OHLG, Jetex, RC, CLS, combat, CL. Clyde E. Howard, C. D., 608 Cherry, Apt. B, Moses Lake, Wash.

12—*Wichita, Kan.:* Class AA "Y" Wichihawks' 3rd Annual Contest for CL, combat, CLS, TR, flying scale. Jean P. Valle, C. D., 3891 E. Bruce, Wichita 10, Kan.

16-19—*Atlanta, Ga.:* Class AAA Greater Southeastern Model Airplane Contest for FFG, CL, OR, OHLG, CLS, CLFS, RC, TR, NC. Lloyd Wason, C. D., 315 Church St., Decatur, Ga.

18-19—*Stanley, Kan.:* Class AAA KC/RC Assn. Midsummer Meet for RC. Len Marshall, C. D., 9115 E. 67th St., Kansas City 29, Mo.

19—*New York City:* Class AA Skyscrapers' 11th Annual Free Flight Contest for FFG, OHLG, OR, TLG. William N. Dunwoody, C. D., 130 85th St., Brooklyn 9, N. Y.

19—*Harvey, Ill.:* Class A R/C[3] Flying Meet for RC. Entry is restricted to members of the Radio Control Club of Chicago. Similar meets also on July 24, Aug. 28, Oct. 2. R. E. Webb, C. D., 1303 W. 79th St., Chicago.

19—*Strongsville, O.:* Class AA Lakewood "Flite-Masters" 1st. Annual Free Flight Meet for FFG. Donald R. Cowgill, C. D., 1567 Wyandotte Ave., Lakewood 7, O.

19—*Los Alamitos, Calif.:* Class AA Long Beach Thunderbugs' Payload Contest for PL, CC. F. L. Swaney, C. D., 527 E. 55th St., Long Beach, Calif.

19—*St. Clair Shores, Mich.:* Class AA Emerald Harbor City Air Fair for combat, CLS, CLFS, CL. Howard A. Lewis, C. D., 21520 California, St. Clair Shores, Mich.

19—*Hagerstown, Md.:* John Young, C. D., Box 691, Hagerstown, Md. Pending.

19—*Millville, N. J.:* Class AA Garden State Aeronauts' June Meet for FFG, CLS, RC, TR, combat, flying scale-beauty. Andrew Canino, C. D., 116 Quince St., Vineland, N. J.

19—*Waterbury, Conn.:* Class AA Modeleers' Stunt and Combat Meet. John C. McKee, C. D., 713 E. Main St., Waterbury, Conn.

25 & 26—*Detroit, Mich.:* Great Lakes Radio Control Meet (to be held in conjunction with the Annual Michigan State Exchange Clubs' Model Airplane Meet).

25 & 26—*Beaumont, Tex.:* Pending.

26—*Kansas City, Mo.:* Class AAA Flying Fools' Third Annual Controlline Contest for CLS, combat, CL, TR, CLFS. Peter W. Asjes, C. D., 5313 Ralston, Kansas City 29, Mo.

26—*Mankato, Minn.:* Class AAA Mankato Exchange Club Model Airplane Meet for FFG, CL, CLS, TLG, combat, CLFS, TR, RC. William B. Thomas, C. D., Box 713, Lake Crystal, Minn.

By Sterling
in PLASTIC! Scale model of
Chris-Craft
42' EXPRESS CRUISER
• All the authentic beauty of the full-sized vessel captured ON THE SHELF!
• Brilliantly designed for actual POWER OPERATION in the water!
Length 14"
Beam 4 1/8"
Kit B-14
$1.98*
*Electric motor not included. Ready for quick, easy assembly.
BREATHTAKINGLY
BIG!
Chris-Craft
42' CORVETTE
World's LARGEST model boat kit
Kit B-15M
$24.95
Deluxe 62-pc. Scale Marine Fitting Set
B-15F $8.95
MAMBO RC TRAINER
A perfect radio control trainer for the beginner! Precise stunting and controlled flying for the expert!
• Incorporates the newest aerodynamic principles!
• Over 2½ years in development!
Kit FS-3,
Span 48"
Length 32½"
$5.95
For engines from .09 to .19
For new catalog, send 10c in coin to cover handling and mailing to MAN 7
Sterling models
Belfield Ave. and Wister St.
Philadelphia 44, Pa.

SA-16 Albatross "TRIPHIBIAN"

54" wingspan SUPER MODEL of GRUMMAN Air Rescue Craft

$25.95 Complete

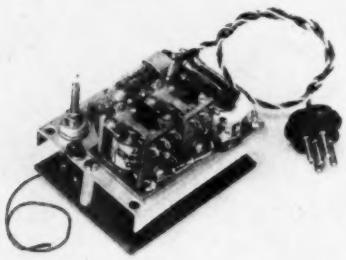
This flight tested beauty is 38 inches in length and kit comes complete with pre-cut parts. All balsa needed for planking entire model. Full size blueprints. Landing gear is built-up with semi-pneumatic rubber tires. Gas tanks are completed. Has beautiful aluminum cowlings, propellers, decals, and many extras.

EUREKA IMPORTING CO., Inc.
4264 Euclid Avenue, San Diego 15, Calif.

See Your **HOBBY DEALER**

Transistorized R/C

CG compiler another FIRST in Radio Control Engineering through the use of transistors in multi-channel equipment.



Subminiature Two Channel Transistorized Receiver MODEL RT-2, Utilizing the Latest Electronic Design Techniques.

a. Transistors
b. Printed Circuitry
c. Tuned Reeds
d. Subminiature Components Throughout
e. Rugged Construction

SPECIFICATIONS

- Carrier frequency 27.255 mcs. tunable
- Audio frequency between 250-400 cps. fixed
- High sensitivity—uses subminiature 1AG4 detector backed-up by TWO transistor amplifiers
- Batteries—uses ONLY one 22½ volt or 30 volt hearing aid battery and one pen light cell
- Power requirements—22½ volts at 1.5 ma (no signal); 3.5 ma (with signal); heater 1½ volts at .04 amps.

WEIGHT:

3½ ozs. less batteries
Complete with batteries, 5½ ozs.

Now it is possible to fly a ½ A Model with two channels.

Bench tested and flown in a ½ A over a period of 5 months to assure you of a top quality fool-proof unit!

We recommend the use of our T-15 Transmitter and M-3 Modulator with the RT-2.

Available through your local dealer

PRICE: $69.95

For your special requirements contact the factory.

CG ELECTRONICS CORPORATION
305 Dallas St., N. E.
Albuquerque, New Mexico

26—*Detroit, Mich.:* Class AAA Michigan State Exchange Clubs' Model Airplane Meet for FFG, CL, OR, TLG, CLS, RC, PL. Entry is restricted to residents of Michigan. Frank P. Sposite, C. D., 9900 E. Jefferson, Detroit 14, Mich.

26—*Fresno, Calif.:* Fresno Gas Model Record Trials for FFG. Similar Record Trials also on July 31, Aug. 28, Sept. 25, Oct. 30, Nov. 27, Dec. 26. Jim Scheidt, C. D., 2225 Brown Ave., Fresno, Calif.

26—*Collegeville, Pa.:* Class AA Cross Key Hawks' 1st Annual Controlline Meet for TR, CL, combat, beauty and destruction derby. George Moir, C. D., Main St., Mantua, N. J.

26—*Wallingford, Conn.:* Class AA Lufbery Circleers' Team Race. Chester A. Orrill, Jr., C. D., 47 Carpenter Ave., Meriden, Conn.

26—*Lakewood, O.:* Free Flight Contest. D. R. Cowgill, C. D., 1567 Wyandotte Ave., Lakewood 7, O. Pending.

JULY

2 & 3—*Houston, Tex.:* Class AAA Houston International Air Show for FFG, CLS, combat, CL, PL. Robert R. Osburn, C. D., 902 17th Ave. N., Texas City, Tex.

2 & 3—*Amarillo, Tex.:* Class AAA Globe News 3rd Annual Model Airplane Meet. James F. Pierce, C. D., 2607 W. 22nd, Amarillo, Tex. Pending.

3—*Chicago:* Class AA 3rd Annual Chicago Prop Nutz Flying Meet for FFG, OHLG, TLG, OR. Peter J. Sotich, C. D., 3851 W. 62nd Place, Chicago 29.

3—*Lancaster, O.:* Class AA Lancaster Skylarks' Club Meet for CL, combat, CLS. Paul McGrew, C. D., 331 E. Main St., Lancaster, O.

3—*Joliet, Ill.:* Exchange Club of Joliet Flying Circus. Glenn F. Stearman, C. D., 604 Abe Street, Joliet, Ill. Pending.

10—*Lancaster, O.:* Pending.

10—*Pittsfield, Mass.:* Class AA 4th Annual Berkshire Model Plane Contest for CLS, combat, TR. Robert L. Elliott, C. D., 48 Curtis Terr., Pittsfield, Mass.

10—*Long Island, N. Y.:* Class AAA Gas Monkeys' 8th Annual Long Island Championships for FFG, jetex, OR, RC. Edwin W. Howe, C. D., 5 Camdike St., Valley Stream, N. Y.

10—*Orangeburg, S. C.:* Class AAA 1st Palmetto Regional Championships for FFG, CL, TLG, OHLG, CLS, CLFS, RC. Larry Bly, Jr., C. D., P. O. Box 744, Orangeburg, S. C.

10—*Evansville, Ind:* Evansville Model Airplane Club Meet for CL, CLS, CLFS, combat, NC. Jerry Knowles, C. D., 1111 W. Delaware, Evansville, Ind.

10—*Buffalo, N. Y.:* Buffalo Exchange Club Meet. Pending.

10 & 17—*Cleveland, O.:* Class AAA 17th Annual Junior Air Races for jetex, TLG, OR, FFG, RC, PL, CL, NC, combat, CLFS, CLS. Charles Tracy, C.D., Aviation Editor, The Cleveland Press, Cleveland 14, O.

11-16—*Travis AFB, Calif.:* Air Force World-Wide Model Airplane Championships for Air Force personnel only.

17—*Hartford, Conn.:* Class AA Insurance City Team Racing Meet. Charles J. Gallagher, C. D., 47 Church St., East Hartford, Conn.

17—*Kobler, Wis.:* Class AA Annual Free Flight Meet for FFG, OHLG, TLG, FFFS, RC. Wilbur A. Lea, C. D., 1030 No. 14th, Sheboygan, Wis.

18-24—*Los Alamitos, Calif.:* Class AAAA National Championship Model Airplane Contest. Send request for entry blank with self-addressed, stamped envelope to AMA, 1025 Connecticut Ave., N. W., Washington 6, D. C.

24—*Milwaukee, Wis.:* Class AA Milwaukee Flying Electrons' 4th Annual Flyspiel for RC. Victor R. Weissbrodt, C. D., 2100 E. Webster Pl., Milwaukee, Wis.

24—*Norwood, Mass.:* Class AA Norwood Society of Model Engineers' Meet for combat, CLS, CLFS. Albert E. Trefethen, C. D., 163 Oakdale Ave., Dedham, Mass.

24—*Ann Arbor, Mich.:* Al Temple, C. D., 9971 Doris, Livonia, Mich. Pending.

30 & 31—*Bristol, Pa.:* Class AA Eastern States Hydro Championships for RC, CLS, NC. Albert E. Abrams, Jr., C. D., 1031 Pond St., Bristol, Pa.

31—*Spartanburg, S. C.:* Class AA 7th All-Dixie Championships for CL, CLS, combat, CLFS, FFG, RC, OHLG, TLG. C. Hill Hutchins, C. D., Box 403, Spartanburg, S. C.

31—*Ann Arbor, Mich.:* Al Temple, C. D., 9971 Doris, Livonia, Mich. Pending.

Key to listing of events: FFG—Free Flight Gas; CL—Controlline Speed; OR—Outdoor Rubber; TLG—Towline Glider; IR—Indoor Rubber; OHLG—Outdoor Hand-Launched Glider; IHLG—Indoor Hand-Launched Glider; CLS—Controlline Precision (Stunt); CLFS—Controlline Flying Scale; RC—Radio Control; TR—Team Racing; FFFS—Free Flight Flying Scale; PL — PAA-Load; CC — PAA Clipper Cargo; NC—Navy Carrier.

Contests designated "Pending" mean the application is before the proper authorities as we go to press; "Record Trials" mean no prizes, but a chance at cracking the records; "Class A" is a meet with restricted entry; "Class AA" is a meet with unrestricted entry; "Class AAA" is a state-wide or regional meet; "Class AAAA" is a national or international meet. END

MAN at Work

(*Continued from page 6*)

Imperialist, 1,240 for .49's to .60's. Seems the Communist has an MVA 301 section which demanded more of a Half-A than most mills put out, although Carl Curtiss took a Nats third in ROW. The Socialist belongs to the "all climb" (timbaire! We calls it!) school of thought. Lyman says no Annual Contest this year, as state is booming with big meets, the Nats included. P.S.: Frank Hauser took first in C, Northern California FF Council Contest, with Fox .59 Imperialist.

• • •

▸ From the Hawksquawk (Wichihawks, Wichita, Kan.): "Through the combined efforts of the club members, the fliers have again been thrown off one of the few remaining flying fields. Members present at the evacuation ceremony attribute their success to the following facts—1. Driving cars on the field after the owner said no; 2. Driving cars on the field when the ground was wet and soggy; 3. Leaving broken airplanes, fuel cans, broken props on flying site." Paper goes on to point out flying sites last longer when it is impossible to get cars on field, mostly because the inevitable spectators make the place a parking lot. RC characters who turn their cars into veritable GCA shacks will always have this drive-in problem. Another pest, in our experience, is the African buffalo type of free flighter who charges out through grain and corn after his airplane, and woe betide anything or anybody that gets in his way.

Speaking of flying sites, the same club paper speaks of city-sponsored sites in Denver, Scotts Bluff, Colorado Springs. In Scotts Bluff, the Bluff Peanut Pilots, a 35-member club (10 to 59) has area for two circles (one lighted for night flying), small race car track and club house. Denver has four model clubs, and three beautiful circles at the city airport, double fenced and surfaced. Colorado Springs established ukie site north of town and, wonder of wonders, supplies free transportation on Sundays. That's for us.

• • •

▸ Disturbing the peace is Walt Mooney, who took time off from his scale building to ask, "Why the emphasis on the no cross-section

Veco PRODUCTS

TUGBOAT 35

Designed Specifically for Radio Control with Electric Power

Ocean Going Type

35" Overall Length

- ★ All Preformed Parts of Styrene.
- ★ Vacuum Formed Hull of 1/8" Styrene.
- ★ Formed Pilot & Deck House.
- ★ Formed Smoke Stack and Ventilators.
- ★ Formed Life Boat, Aft Cabin, and Skeg.
- ★ Diecut Planked Deck of Plywood.
- ★ All Metal Fittings Provided. Propeller · Stuffing Box · Driveshaft · Rudder · Steering Arm Searchlight · Whistle · Bell · Portholes.

Kit Price $24.95

Veco PRODUCTS

THUNDERBIRD

Kit Price $8.95

BOB PALMERS LATEST DESIGN

California State STUNT CHAMPION

Palmer says, "This Model with the New Veco ".35" is the Greatest Combination I have ever flown."

- Big 54 In. Wing Span
- Wing Area 597 Sq. In.
- For Engine .29 to .35 Disp.
- Highest Quality Materials
- 3-Dimensional Picture Plans
- All Prefabricated Parts

HENRY ENGINEERING CO. · BURBANK · CALIFORNIA

rules?

"I think the main reason for the popularity of the PAA-Load and Clipper Cargo events is that they are a challenge. Having solved the problem better than anyone else and winning the event, the contestant has a prize worth keeping. Admittedly, the rules are fair," declares Walt. "Rules don't help the hobby when they eliminate the cross-section. Eliminating the cross-section from Wakefield was bad enough, but the latest rumor has it that the ROG rule may be dropped. This rule separates the men from the boys; leaving it out is like removing the finish line from a race. If the rules are going to be changed, let's reinstate the cross-section rules everywhere and, for free flight, I would like to see a power loading of 300 oz. per cu. in. There ought to be lots of people that agree with me." Heh, you out there, do you agree?

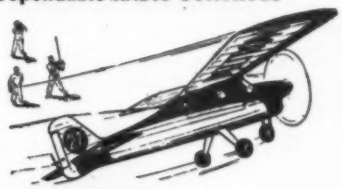
Hate to get serious, but remember that processing after the war was so bad that in order to end the line by 4:30 in the afternoon, rules had to be simplified, hence no wing loading, no cross-section. If guys would make things square, it would be easy, but elliptical wings, oval cross-sections going into pylons—oh, boy! On power loadings, MAN at Work agrees, but, being a hard working man (joke), that's to be expected. Free flight boys long since forgot how to design airplanes—they don't have to know. Our own pet recommendation: Wakefield rules should be made out of plastic.

• • •

Always with an ear to the ground for sometimes difficult-to-get items, perked up when Larry Conover mentioned bull sessions with Glen Sigafoose. Glen is the Sig of Sig Balsa. Now we are steeped in grades of balsa, grains, weights, and who cuts what from which. No, we are not going to recommend Sig over, say, Testor, who cuts fine wood, but we are going to say, for the benefit of contest modelers who are up a creek when the dealer hasn't got a really soft sheet—which they have to have or else—that Sig maintains a money-losing service on such woods for the special hobbyist. It isn't feasible to spread the dealer's wood all over his shiny floor while you look for a quarter-grained piece. If you have a special need, ask Sig for his info list on contest balsa . . . After searching country over for a Fairchild PT kit, J. Pritz, Brooklyn, N. Y., tells us California Model Co., 5885 Falcon Ave., Long Beach, Calif., has one. You other PT askers for, now you know. Incidentally, isn't this the company with Taibi's Spacer? . . . Hear tell that some yummy Japanese tissue—red, black, yellow, white—can be had for a fat nickel a sheet from Swaney's Hobby House, 527 E. 55th St., Long Beach, Calif. Also has red and yellow aniline dyes at 35¢. Strangers to us, but those items are much sought after . . . Dale Kirn, the well known speed and jet flier, and W. L. Murray, are traveling the country in a Chevvy station wagon demonstrating Stanzel's Mono-Line trainers, stunters and speed jobs. They'll be at contest, club meetings, your dealers'. Reminds us of Carl Goldberg's safari for Comet before the war . . . Younger subscribers who have "parent trouble" over their modeling activity might lend an ear to Art Winston, America's Hobby Center, who answered one of mail order customer's complaints with these words of wisdom: "Why do your parents think your modeling is foolish? Could it be that you litter your room or the house? Leave your materials underfoot? Don't finish your planes? Can't afford it? Or do you neglect homework, and regular go-to-sleep hours, house chores, etc.?

"What do you do to deserve being allowed to build model airplanes (say, Art, now you have us scratching our haid!)? Are you keeping your parents in a position of owing you something for your courtesy, help,

Dependable RADIO CONTROLS



DELTRON PERFORMANCE GUARANTEED!

Here's your dream of dependability; does away with repeated adjusting, tuning and testing. Weights only 2 oz. including plug. Size 3" x 1⅛". Rugged. Engineered to "take it." Complete, fully assembled of new, top quality components. **$24.95**

T 100 TRANSMITTER

3-watts+ power packed into a light easy-to-carry 3" x 5" x 7" case. Micro-action keying button, telescopic antenna. Complete with tube, and crystal, less batteries.

$29.95

24-hour Service Write Today

DELTRON CO.

1940 CONQUISTA AVE., LONG BEACH 15, CALIF.

respect?"

▸ Quite a chat with K. Kokubo (Mr. Eureka) and Bernard Asner, his American importer. Eureka, as you know, goes in heavily for elaborate multi-engined kits. For years we've been receiving armed services publicity shots showing some burly sergeant or colonel holding a B-29. The B-29's always were the same—big, fascinating things. Now the mystery is solved. Mr. Kokubo caused it all. So today we have a kit, by mail, that knocks us gaw-gaw. Stunned.

These fellows have cut out of plywood all the ring formers—and there is a pile of them and all the tapered ribs. The rearmost formers include the fin spars—and these are cut out for lightness. There are four circular fuel tanks, actually notched to fit between motor bearers—even four props. Celluloid turrets and blisters, eight of them. Split metal cowls. Sawed out and shaped cowl fronts. Landing gear assemblies with twin wheels in place, soldered washers and all. Mounting plates and spring shock absorbers on the gear. And so on, and on, and on. It's a bomber, any way you want to look at it!

• • •

SUPER PLANS

50¢ p.p.

Three big full size plans. Featured plan (top row each set) on giant 35 x 45 inch sheet; others printed on reverse side. Each set 50¢ postpaid.

Set No. 1
- ☐ BOOMER: Delightful free flight pusher for Half-A.
- RE-8: World War I crate, .29's, etc., stunts.
- SNAPPY: Rubber-powered ornithopter (wing flapper).

• • • •

Set No. 2
- ☐ TRIPLE THREAT—1/2-A FF. June '55
- THE VETO—VTO stunter. June '55
- A-BOMB—Stunt; .19's and up. June '55

• • • •

Set No. 3
- ☐ HALF FAST—Nats combat ukie. Apr. '55
- PERDIDO—Contest FF for .19. Apr. '55
- SHOREBOAT—RC boat for .09. Apr. '55

• • • •

Set No. 4
- ☐ HEATH PARASOL—FF, RC, .075-.09. Feb. '55
- GUARDIAN—.29 Carrier winner. Feb. '55
- SHARPIE—FF sport, .02-.049. Feb. '55

MAILING INSTRUCTIONS. IMPORTANT!

Plans mailed, postpaid, by Third Class mail unless otherwise specified. For First Class, add 10¢; for Air Mail, add 20¢ for each set of three super plans.

MODEL AIRPLANE NEWS

551 Fifth Ave., New York 17, N. Y.

Enclosed is _____ for plan sets as checked.

Name _____ Please print

Address _____

City _____ Zone _____ State _____

▸ Irv Megeff, ESSCO, to remind everyone that the Citizen's Band is not license-free. It is just examination-free. If you didn't get your license, and about 25,000 modelers have not, you are illegally using RC. Besides, FCC won't grant an additional frequency, for the 6,000 licensed RC modelers are not enough to make a case . . . Second Annual Western New York Air Show and Racer, July 3, Dansville, N. Y. Closed course racing, Cole Brothers' Air Show, jet fly-overs . . . You know that the plastic tank on the Cub is made by the Auburn (N. Y.) Button Works, Inc.? We're serious. If this firm thinks enough of the model business to put out a release, we hasten to mention them. The tank, incidentally, is red, translucent nylon . . . What happens when you get your name in Pen Pals? Alan Hulme, at one of those five-line British addresses, says plenty. "Thanks for your announcement in January Pen Pals. Received more letters than I can cope with. I have replied to all letters and passed on many to my pals so that I can continue building!" . . . Just off the press is a brand new hobby catalogue (25¢, America's Hobby Center, Inc., 152 W. 25th St., New York 1, N. Y.), a 64-page, two-color complete guide containing everything for the hobbyist. Fully illustrated, the brand new catalogue features full descriptive information and pictures of over 10,000 hobby items. END

Engine Review

(*Continued from page* 33)

use from both a Sky Fury and an outboard Sea Fury, we feel justified in reiterating our high opinion of the engine and especially of the Allyn plugs which on the outboard really take hard use. The originals are still satisfactory long after the time in which, in our experience, plugs with this type of element burn out.

In conclusion, a tip which may help those who have had trouble keeping the outboard clamps tight. Use 1/4 in. plywood or thicker for the transom, and bore holes 1/8 in. deep for the clamp screw pads. In the bottom of the holes put small rubber plugs about 1/16 in. thick and screw the clamps up finger tight. This seems to stop vibration from loosening the clamps and also provides positive location for the engine. END

Plans for Scale

(*Continued from page* 25)

photostat is limited to the builder's personal use and is not intended for commercial purposes. Note of caution: since photostats shrink in the drying, a large print may become distorted enough that adjacent plates may not match exactly. If you live in a small town and don't know where to obtain a photostat, an attorney should be able to tell you where. Photostats are used to make copies of documents, etc.

The second great source of scale plans is books. These plans are almost always three-views and seldom have cross-sections, and may require further research to fill in. Published yearly since the first World War is the *Aircraft Year Book*. Three-views of virtually every production-type American plane for the given year appear in fair size, usually page size. The internationally famous Jane's *All the World's Aircraft*, the Bible of the industry, has been published annually since 1909. Current copies run to $20 apiece; old ones are collectors' items, often bringing $150 and more a copy. But how can you see such books? Central libraries in the larger cities may have them. Your local library will make inquiries of the state library to see if such a book is available to you. In the case of periodicals or rare books that cannot be taken out, you may examine them at the library, and perhaps arrange for photostatic copies of drawings of interest.

NO MORE CRACK-UPS with this natural method of control line flying. Operator has perfect control of plane at all times. Safe inverted flying, loops and figure "8's" . . . easy with the all-metal CRAFTSMEN T-HANDLE. Outperforms them all!

POSTPAID **$2.00**

CRAFTSMEN MFG. CO.

4460 State Line **Kansas City, Kans.**

SAVE WEIGHT in Radio Control

use a

NEWX ESCAPEMENT

BODY SIZE 3/4"x 3/4"x 9/16"

With the most powerful coil in any miniature design. This large more powerful coil requires less current.
This means smaller batteries can be used. Batteries weigh many times as much as the escapement.

Smaller Batteries

SAVE MORE THAN ESCAPEMENTS TOTAL WEIGHT !

Model 512 requires 2.0 V. @ 150 ma.
Model 506 requires 1.1 V. @ 290 ma.
Weight ½ oz. $7.95
See your dealer or write to-

NEWX PRODUCTS CO.
BOX 643 UNION, NEW YORK

DEALERS!

Send for a free sample Copy of the hobby industry's leading trade magazine.

Packed full of information designed to help you sell more hobby merchandise.

CRAFT, MODEL & HOBBY INDUSTRY

30 E. 29th St. **New York 16**

Jane's, however, is not a consistent publisher of three-views. Some years included many; other years, none at all. Jane's is the last word, though, on airplane specifications and descriptions, and is copiously illustrated with large clear pictures.

The Institute of Aeronautical Sciences and the National Air Museum also makes photostatic copies, at varying costs, of specific articles and published drawings that can be cited to them. One shudders at the thought of hundreds of modelers suddenly swamping those august bodies with requests for this and that; so try them only when all other sources fail. When the magazines do not have anything on the particular item, they usually make recommendations to these and other additional contacts that can be tried.

In recent years, but on a from-time-to-time basis, various publishers have introduced a "poor man's Jane's" type of thing, often containing dozens of good three-views. *The Aircraft of the World* by William Green and Gerald Pollinger, published by Hanover House, Garden City, N. Y. (1954), is a foremost example. American aviation magazines, such as Aero Digest and Aviation Week, sometimes contain three-views, but only their Annual Issues that often contain small three-views are worth while prospects. For practical reasons, these issues will have to be seen at the library. Foreign aviation magazines print quite a few three-views: Flight and Aeroplane in Great Britain, for example, and Hebdomadaire Aviation in France. The latter runs occasional historic types and it is a pity that a comparable popular magazine is not published in this country.

The third great source of three-views, and these drawings very often are slanted for modeling use and therefore have cross-sections, is the aircraft manufacturers. Some companies, like Lockheed and Northrop, have been quite conscious for years of the thousands of scale modelers, and sometimes have impressive prints available just for the trouble of writing. Other manufacturers, despite the lip service to air youth and modeling, won't bother to answer your letter. But try them all—maybe the indifferent ones will see the light. Names and addresses are listed in trade magazine advertisements and in Jane's. Also, this magazine will advise you where to write whenever its own references do not include the item you need.

The Navy, which plays host to the Nationals each year, is public relations minded enough to have three-view drawings, cross-sections, and all, available on request. The Navy arranged this deal in cooperation with the aircraft manufacturers and it is more than likely that manufacturers who won't answer your letter will have their drawings available through the Navy. Write Lieut. Cmdr. Richard D. Lazenby, Office of Information, Department of the Navy, Washington 25, D. C. for three-views of Navy types. Every plane will not be available, but if they have the job you want, you can count on getting it. In particular, Vought did a thoughtful job in providing three-views of historic Vought types, back to their first catapult biplane.

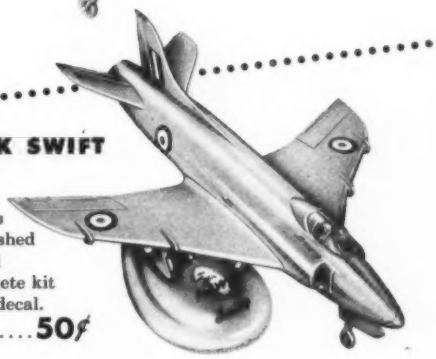
Now what can be done about missing cross-sections, in the case of simpler drawings that are not fully detailed? Of course, you can try a letter to the manufacturers of the plane, if they are still in business, but the chances of getting such special information are practically nil. It's a long, long shot. But you can refer to Year Books or to Jane's, the latter especially to see if airfoils are mentioned. If so, the airfoil sections may be obtained from the Superintendent of Documents, Washington, D. C. On your first inquiry, you will be given a list with prices of particular NACA reports touching

build HAWK models
the Quality brand
PERFECT IN DETAIL AND SCALE

HAWK THUNDERSTREAK

Loaded with armament, this silver and blue fighter has 24 rockets suspended from its wings. Authentic in detail even to the "greenhouse" canopy. Complete kit including instruction sheet and decal.

Catalog No. 606.....50¢



HAWK SWIFT

This famous British fighter is a *must* for your collection. Molded from patterns made from data and specs furnished by the manufacturer, this model is perfect in every detail. Complete kit including instruction sheet and decal.

Catalog No. 607.....50¢

See these and many other kits at your dealer TODAY!

BUILD A COMPLETE COLLECTION OF HAWK PLASTIC SCALE MODEL AIRPLANES

MIG Russian Jet Fighter Cat. No. 707.....$ .69	Banshee, F2H-2 Cat. No. 501....$ .89	Corsair F4U-1D Cat. No. 604..$ .50
Dart XF 92A Cat. No. 605.....$ .50	Grumman Panther (F9F) Cat. No. 400....$ .69	Lockheed F-90 Cat. No. 500..$ .89

Write today for a free catalog of other HAWK planes
Sorry no orders accepted at the factory

HAWK MODEL COMPANY 4314-22 N. California Ave., Chicago 18, Illinois

3 NEW RADIO BOOKS

"RADIO CONTROL of MODEL SHIPS BOATS and AIRCRAFT"

Written by Mr. F. C. Judd, world famous Development and Radar Engineer. Attractive 3-tone cover, all of its 140 pages on gloss paper. Contains over 50 photos of equipment, many full page photos, plus over 200 circuits and sketches. Explains how to electrify your rubber driven escapments, make complex multi-action actuators from clock and watch mechanisms, cam control actuators, etc. Aerial charts never before shown. New Relay drive selector switches. Parallel line oscillators. Also shows 40 TUBE MONSTER RECEIVER, plus RECEIVER WITH 8 CHANNELS, 12 RELAYS controlling 6 SERVO MOTORS. Simple one, two & three tube units also given. The combination of the Schematic, plus instructions and photos of the finished units help you to produce the items shown in the book for your own use. Practically any type of Boat or Aircraft can be controlled with the use of the equipment shown.

LOOK ONLY 25c ☐

New 84 page plans catalogue featuring over 400 models. We include FREE sample copy "AEROMODELLER" magazine and Phamplets showing sample pages of above and other new books.

Radio Control of Models.....$2.50
Radio Control of Model Aircraft.....2.98
Radio Control of Ships, Boats and Aircraft..2.98

Check Off Books You Want Above—Add 10c Postage Per Book. Print Your Name and Address In Column This Ad:

GULL MODEL AIRPLANE CO., 10 EAST OVERLEA AVE., DEPT. M BALTIMORE 6, MD.

LOOK
SIGMA 4F
8000 OHM RELAYS
$2.60 each

These relays actually new — never used — just installed.

Removed from surplus Army radar equipment, that was never used.

Each relay has been fully checked and tested.

Order now; limited supply. Post paid.

HOBBY CENTER
1206 North Main Street
DAYTON 5, OHIO

Check or money order. No C.O.D.

Cover in style

FINEST IMPORTED
SILK RED YELLOW ORANGE WHITE **.95** per yd.

FINE WEAVE DURABLE
NYLON WHITE ONLY **1.15** per yd.

All In 36" Width, Any Length You Order

SPECIAL For Cowled or Open, Gle or Ignition Engines

Miniature plug & socket (all wired) for immediate connection of booster battery & engine. No more worries about clips falling off or shorting. **1.00**

DEALER INQUIRIES INVITED
Please send cash, check or money order, sorry no C.O.D.
MODEL COVERING CO.
56 EAST 43rd STREET, BROOKLYN 3, N. Y.

HOT SHOT POWER PAC
Complete with Charger only $6.95
F.O.B. Ken. ha

A Storage Battery Engineered for model airplane starting. 4" x 6½" x 6½" high. Compartment to hold 1 Pt. gas can, tools, props. Handy handle, hard rubber case, 5 full plates. 2 Volt, 1 amp. for 30 hrs. 5 Lb.

You can always have a Hot Battery Now! Long Life with care, 10 Years.

SEE YOUR DEALER

ORDER TODAY ON 5 DAY TRIAL. SEND $5.00. PAY BALANCE C.O.D.

GREAT LAKES BATTERY CO.
DEPT. 27—KENOSHA, WISCONSIN

on airfoils, and you then order the booklet you need. Fuselage cross-sections will have to be dubbed in from studying photographs of the plane obtained from manufacturers, a photo supply house, or in some book or magazine. Perhaps the plane is closely related to another ship on which you have all the dope, and then you may have a clue to the approximate cross-sections. Make a small carved balsa fuselage, then cut it crosswise into slices; this will give cross-sections. Draw the cross-section; then, either enlarge it yourself by mechanical drafting, or have photostats made to the desired size. Use one side of the centerline only to insure symmetry.

Don't give up just because you don't have the full size plans. The simplest way to enlarge a drawing accurately to rule off the borders into spaces, such as 1/4, then connect the points on each border with the corresponding points on the opposite border, which gives a graphpaper appearance. On your large paper, make a bigger rectangle, such as two, three, four times the size of the original borders, and then mark off the big borders every 1/2 in., 1 in., etc., depending on the scale of enlargement. After the points are connected as before, you just count squares and fractions of squares to find where the lines of the drawing intersect the squares. This is fourth grade stuff.

But it is hard to draw those purty curves. Pin a strip of 1/8 square, 3/16 square, etc., to the big drawing, running it through the points of the curve. If you are strong enough to hold a pencil, the rest is obvious. For bad curves, use thin wood, as 1/16 x 1/8 on edge. A French curve, a common and easily obtained drawing tool, is the proper instrument.

A simple trick is to place a straight-edged scrap of paper over the two points that are to be enlarged, mark the two points on the paper, then transfer the paper scrap to the large sheet and repeat the measurement two, three, etc., times, as necessary for your full size. Proportionate dividers are ideal for transferring scaled up measurements. Many magazine plans have a bar scale which shows the size of an inch and fractional parts thereof. Place a piece of paper edgewise against this scale and transfer the marks; then use the paper scale (ruler) on the small plan to read measurements, and put those measurements on the big plan with a regular ruler.

Any serious scale modeler who can afford the price should have a simple set of drawing tools, consisting of pencil, compass, dividers, good ruler or scale, one or more French curves, T-square and 30 and 45° triangles. Worth its weight in gold is a ship's curve. This is a long, almost flat, curve, ideal for drawing longerons, etc. Ship's curves, like French curves, come in graduated shapes that will fit any contour you can think of.

Actually, a plain wooden T-square and a straight-edged table top—the kitchen table, the work bench, or a piece of thick plywood —will, with pencil and ruler, enable you to make a drawing, although you'll take longer to complete it. Most kitchens have useful hard top tables. You can't stick pins in them if you try—besides, Mother would scalp you. But small tabs of Scotch tape will hold the paper to the table. Cheap drawing paper, from the stationery store is good enough for a penciled working drawing.

Most would-be draftsmen have trouble getting started. If you don't want to work with a time-consuming grid system, as described above, begin with a handy reference line. The thrustline is a good point to begin the fuselage, although a truly straight horizontal line, or base line, can be drawn flush with the top or the bottom of the fuselage. Vertical cross lines, easy with a T-square, or with a triangle resting on the T-square, if you have both tools, allow you to measure up or down from base lines to establish the points of the fuselage at every cross-section or station.

On outlines, draw the straight lines first, then fill in with the curves, using bent wood, if need be. If you can't pin down the wood, have someone help you hold it in the desired position. Most wings have parallel edges and ribs at right angles; this is an obvious cinch. For curved tips make a squared grid, as before. If the curve is tight, don't try to draw it in one operation. Take your pencil loosely and swing it back and forth, sketching in the curve lightly. So you got the line 1/4 in. wide? Draw the final line darkly and rub the rest away with a soap eraser.

For flying models, it becomes necessary to find stringer positions. This is hard, true. Take several typical cross-sections, one forward, one amidships, and one at the rear, and mark the desired positions of stringers. Transfer these points to the vertical lines that represent these sections on the side view. On the top view, measure out from the center line the distance to each of these points. Using a flexible strip of balsa as a French curve to connect these points, the resulting line automatically finds the correct points at intervening stations. Cross-sections can also be drawn one over the other to reveal if any of them is going to cause bumps or depressions on the other surface of the finished fuselage.

For your final attempt, try some old square-sides, like the Piper Cub. The Sabres, etc., will come naturally. END

Radio Control News

(*Continued from page* 21)

314 Fifth Ave., New York City, have imported a German RC unit which consists of a two-tube transmitter, a three-tube receiver and an unusual escapement. The transmitter case has a compartment for the receiver and the receiver battery container. The price is unannounced, as this is written, and we're still trying to decipher the German instructions, prior to their English printing. In addition to the unusual relay, which is similar to the design we had in MAN back in '47 or '48, the extremely different point of interest is the electric eye tuning on the receiver.

A sub-miniature tube allows fine tuning to be made by observing the "null" or shadow in the tube.

This is something radically different and we'll have more on it next month. For that new sub-miniature, lightweight receiver, you could use the new Yardney Silvercel, model HR-01. The photo shows this amazing power package which measures only 3/16 x 5/8 x 1-1/8 in. and which weighs 1/6 oz. Having a current capacity of 1/10 am/hour, this type of cell is rechargeable and has quite a flat discharge curve. It will provide a peak discharge of 2 amps without damage to the cell. These cells are widely used in missiles and other airborne equipment and additional information may be had on this and other Silvercels by writing to Yardney Electric Corp., 40 Leonard St., New York 13, N. Y. Silvercels are used quite a bit in England for duration and long distance flights.

Gyro Electronics Co., 325 Canal St., New York City, has a three-tone modulator unit which will enable you to modulate a carrier almost 100 per cent. The stable one-tube circuit is in kit form and it comes complete with three push buttons, tube, case switches, etc., for only $5.85. This unit will operate any tone-actuated receiver in use at present. A companion piece of equipment to go with the above is the Joystick, a small, hand-held, four-position switch. Cleverly designed

and using telephone type contacts, this completely assembled unit for $2.95 gives real "stick" action. Contact action is positive. The stick will always return to neutral upon releasing it.

A very unique sensitive relay, small in size, lightweight and fully adjustable is marketed by Advance Electric & Relay Co., 2435 N. Naomi St., Burbank, Calif. Available with 4,000, 6,500 and 10,000 ohm coils, the SO series weighs but 1.4 oz. and has a sensitivity of 10 milliwatts. Measuring approximately 1-3/32 x 1-3/16 x 1-3/16 in., this new relay will operate, under certain settings, as low as 2 mw. This looks like a really fine relay.

CLUB NEWS

They say that the sun never sets on the British Empire. It now seems that once an RC job gets in the air over British soil, it too is reluctant to set. Frank Bethwaite, a New Zealand airline pilot, had his Mills 1.3 cc-powered model in the air for three hours and two minutes plus a few odd seconds. Sent aloft at 5 p.m., it had to be brought down at two minutes after 8 p.m. because of darkness, having flown at altitudes up to 1,500 ft. More on this record at a later date, but this is the second long, long flight using a Mills 1.3 cc Diesel.

A photo from E. H. Schoenberg of the Seattle Radio Aero Club, 5262 11th, N.E., Seattle 5, Wash. shows one of the best line-ups of RC ships we've seen in a long time. Quite a few scale jobs, too. Although having flown RC for several years, the club felt they "weren't getting anyplace." What did they do about it? They instituted a monthly contest on AMA rules and in this way they have sharpened up their flying. Too many fliers go out and "just fly around" and then wonder why they don't win when they enter a contest.

Remember, you can't enter a sanctioned AMA contest without your FCC certification. Send your registration in today.

Carl Cantera, 11 Cantera Rd., Augustine Hills, Wilmington, Del. advises of the formation of a new RC club in that area. It is hoped that the name of the club will have no influence on their flying. Anyone interested in RC work in the Wilmington area is welcome to join. Guess we'll have to give you the name—The Lost Controllers. Ouch!

Don Still of Don Still's Happy Hobby Haven, 790 Liberty Ave., Beaumont, Tex. has scaled up a Beam to a 75 in. span, 12 in. chord and a 51 in. fuselage. The radio set-up is with a 27 mc receiver handling the rudder and engine control, by means of a Bonner Compound and a 465 mc receiver on the elevators. A deBolt 2PN is used for actuating the elevators. He also reports that the Sigma 26F relay is tops when installed in the Citizen-Ship 465 mc receiver. We agree with Don on this point, since the 26F will operate much more reliably than the 4F, in this particular circuit.

Dick Schumacher, Consulting Engineer for Babcock Radio Engineering, Inc., Van Nuys, Calif., points out the ruggedness of the new Babcock Super Compound escapement. After ending up in a death dive (it even happens to the experts, fellas) which broke the stab in half through shock, the escapement checked out perfectly, with *no* adjustments, when placed on the test stand. Mighty rugged, eh? See beginning of column for more detailed sketches of the rudder-elevator linkage on this new compound escapement.

Paul Slingby, 2135 S. Parkwood St., Wichita, Kan., the Secretary of the Wichita Radio Control Club, advises that the club has a membership of more than 28, after being "in business" for about eight months. The oldest member, and one of the best known from the earlier days of RC flying, is Charles Seigfried. Two-tube receivers are most popular with our -MOPA transmitter and the

AT LAST!
Paul Gilliam's World Famous
CIVY
61" span
FOR ENGINES .19 TO .35
$7.50
TEXAS EAGLES
REALLY PREFABRICATED
In the eight years since Paul Gilliam designed the first of the fabulous 'Civy Boys', no other free-flight has appeared that can even begin to compare with this airplane.
Built by hundreds of modelers from plans in 'Model Airplane News', the 'Civy Boy' has been tested and proven in contest after contest, piling up a record of wins that has never been matched by any model.
Now KENHI brings you the best of all the 'Civy Boys', the 'Civy Boy 61'! Wait til you see it! There's no skimping in this kit - with it you can build an exact duplicate of Paul's own prize-winner. Every rib and spar is just as he designed it - and it's all prefabricated, even the built-up fuselage! Don't miss it!
KENHI MODEL PRODUCTS ANAHEIM, CALIFORNIA

"AIRCRAFT OF THE 1914-1918 WAR"

10 DAY FREE TRIAL

Contains 234 large 11 x 8 3/4 pages, of over 200 World War I Aircraft. 80 full page 1/72" scale plans. Hundreds of clear photos show complete Insignia & Squadron markings. 14 photos of squadron line ups. Every country's aircraft shown—British, Italian, German, Belgian, etc. Full details of weight, power plant, armament & other engineering details. Plus "History" of each plane. Further 94 photos give Rare & Experimental types. Book is invaluable to Solid Model builders & to Detailed Museum Type builders. This is a collectors item, a masterpiece of exact detail and engineering info. Book weighs almost 2 pounds. It's sold on a 100 per cent money back guarantee. Send the price of $11.95 today (shipped prepd) keep it 10 days. If not satisfied, return it and we give full purchase price refund.

CLOTH BOUND - - - - - Price $11.95 ( )

8 page two color descriptive circular on above.....25c ( )

PIRELLI RUBBER

1/4"—270 ft. per hank.....$4.98 ( )
3/16"—270 ft. per hank..... 3.98 ( )
Trial 40 ft. hank of 1/4".....1.00 ( )

RADIO BOOKS

Radio Control of Models.....$2.50 ( )
Radio Control of Model Aircraft.....3.98 ( )
Radio Control of Ships, Boats and Aircraft..3.98 ( )

Gull Model Airplane Co., 10 E. Overlea Ave. Dept. M Baltimore 6, Maryland

FULL-SIZE PLANS

EACH SET OF PLANS FOR 25c

☐ JENNY: Free flight scale, .049.
MARS: Bob Palmer stunter, .29-.35.

☐ WINNIE MAE: Lockheed Vega ukie, .049.
PELICAN: Willard flying boat, .049.

☐ VICTOR SCOUT: Scale control, .075.
SUPERMARINE: Ducted fan job for .09.

☐ THE SPACER: Class AB free flight.
STUMPY: .09 combat U-control.

☐ THE CHAMP: Profile free flight .049.
THE TWELVE: .29 - .35 stunter.

☐ MAYBE: .09 sport free flight.
SCRAMBLER: .29 team racer.

☐ WIMPY: .049 scale free flight.
HIGGINS CABIN CRUISER: .09 - .19 boat.

☐ HI BOY!: Palmer stunt .29.
HALF-A DELTA: Free flight delta.

☐ SNIPE: Half-A stunt.
STRATOHAWK: Limited rubber.

☐ SMARTIE: .29 - .35 stunt bipe.
PENNY: Outboard boat.
LI'L SPEED MERCHANT: .049 speed.

☐ SHOEHORN: .049 flying boat.
ALKIE IV: .049 free flight.
QUICK 60: CD speed.

☐ APACHE: .049 free flight.
FABULOUS HAWKS: .14 - .29 scale.

☐ SHEIK: .29 team racer.
DRIFTWOOD: .049 free flight.

☐ FOXY: Aldrich .29 combat.
BIG TIME: Large towliner.

☐ SPOOKY: .09 stunter.
SLOWPOKE: .09 sport free flight.

☐ EL DIABLO: .19-.35 stunter.
TRI-PACER: Scale ukie Piper.
PLAY PLANE: All-balsa FF, .049.

☐ HOT FOOT: Stunt bipe, .29 - .35.
DOUBLE FEATURE: Rubber — .049 combo.

☐ LONG TOM: .29 - .35 free flight.
SIDEWINDER: .049 profile ukie.

☐ GYRATOR: .29 - .35 stunter.
AERONUT: .19 free flight.

☐ BOUNDER: Record .29 speed.
ZEPHYR: .049 free flight.

☐ NOBLER: Aldrich .29 stunt.
FUNSTER: Hot .049 free flight.

☐ SKY WING: .049 flying wing.
CHALLENGER: .29 team racer.

MAILING INSTRUCTIONS. IMPORTANT!

Add 5c for postage and packaging on orders mailed 3rd Class. For First Class add 10c for postage and packaging and for Air Mail add 15c for postage and packaging, for EACH set of plans. Plans available only in groups as listed.

MODEL AIRPLANE NEWS
551 Fifth Ave., New York 17, N. Y.

Enclosed is.....for which send me the sets of plans which I have checked. 1st class & air mail postage being extra.

Name Please print

Address

City **Zone** **State**

Mac II transmitter, doing the signal sending. While aircraft and boats are predominant, model autos have made a good showing. Interest in reed and other audio equipment is picking up and log books are used to keep a record of flying time plus important data on each flight. Some of the older members are compiling a scrap book of receiver circuits, etc., for the aid of beginners. Any other RC club is requested to exchange ideas, info, etc. with this up and coming club.

Hear ye, hear ye! All those interested in "projects" read this. From the "Pearl of the Antillies," A. V. Alvarado III, Kelvinator Arellano Co., S. A., Paseo de Marti No. 203, Havana, Cuba tells of plans for a Key West to Cuba radio controlled flight. Quite a bit of work is being done in checking on weather conditions, wind, etc. Since PAA sponsored an overwater flight in Japan, some years ago, this might be right down their alley. After all, they have been doing this sort of thing in England and, with a slight tailwind, it shouldn't be impossible. This sort of flight is followed in a boat or a plane, which has the control transmitter. Why not a flight like this over the plains of Texas or the Middle West? This should be a good deal for the Wichita club.

Looking for something new in the way of flying RC jobs? The New Zealand boys have a few unusual tricks. Since they have two free bands, on 27 and 35 mc, they set up two "camps" about 100 yards apart and have a "buzzing" contest. Nothing like an old fashioned strafing. If you survive this first test, you can try flying the model between goalposts set up with light balsa or bamboo poles. Having come through this last one in good shape, try a race around a triangular course, 300 yards between pylons. Sounds easy? The only thing we forgot to mention is that the model must land and the transmitter be turned off within three minutes after launching.

For those of you working on a duration design, it might be pointed out that the British, Australian and New Zealand boys go in for placing the engine on top and toward the rear of the wing, the reasons being that, besides cleaner operation, important during a three hour run, there is less drag created and the available thrust is used to its full advantage. Also, small engines may be used and in this way fuel consumption is decreased.

Ralph Stoltz of the KC/RC Assn. hopes that all of the early readers of this month's column will plan to attend their AMA sanctioned radio control contest to be held June 18-19. In addition to the contest, there will be a general get-together on Saturday night, the 18th. At the time of this writing, the contest site was still pending and later information may be obtained from A. R. Peterson, Pete's Hobby Shop, 5725 Prospect Ave., Kansas City, Mo. This is an up and coming RC club in the Middle West and we believe this will really be a fine gathering of the clan. This club, incidentally, is going in for RC cars. They don't spin-in or sink, and should be around for quite a while. In addition to this, they all have a "swap" night at some of their club meetings. Just the place to get rid of your old equipment or parts and pick up something new. An excellent idea, which is catching on in other parts of the country, also.

From Bill Butler, Public Relations Dept. of the LARKS (Los Angeles Radio Controllers), 8856 Earhart Ave., Los Angeles 45, Calif., says there is a monthly battle for the multi-channel and single-channel trophy. In the multi-channel class, Colby Evett is top man, followed by Charles Boyer, Howard Bonner, Dr. Dale Hanck and Dean Kenney. Single-channel honors are held by the wizard of slope soaring, Webb Hill, and followed by Deryl Bergstrom and Stan Calmy. The LARKS will put on the RC event at the '55 Nats so it should be well run. Keith Storey with the LARKS to develop RC team race rules and patterns. Big problem at present on this type of flying is the ability to hold a given altitude while making turns and other maneuvers. And now to get back to our pet project at the time, the single-channel event. This group is highly in favor of this, since it would leave the way open for unlimited development. However, the rudder-only event should still be maintained for the novice and the multi-channel for those who desire it. We'd like to hear more on this subject and individuals and clubs are urged to drop us a line. Better yet, drop a line to the AMA, 1025 Connecticut Ave., N.W., Washington 6, D.C.

END

Man To Beat

(*Continued from page* 26)

licked, the flying characteristics of the plane received some attention. To reduce the floating tendency, the wing was reduced to 12.5 in. chord and 7 ft. 4 in. span. The stabilizer was decreased at the same time. In all of his planes Alex has stuck pretty close to the 40, 20, 10 formula; tail moment, 40 per cent of the wing span; stabilizer area, 20 per cent of the wing area; and fin area, 10 per cent of the wing area. The changes made greatly improved the performance of the plane. The weight was up to 7-1/2 lb., giving a wing loading of a little less than 1 lb. per sq. ft. By our present standards the loading was a little on the light side, but the plane was the best and most consistent flier in the area.

Alex flew this first Cub almost every Sunday for about a year. He never did much in the way of stunt maneuvers with it. Instead, he spent the time learning to handle the plane and the controls. It was a very steady, realistic flier and he got to the point where he could put it right where he wanted it every time.

The next model was a departure from the Cub series. It had the same general proportions and lay-out as the Cub, but there were several radical changes. The wing was lowered, the stabilizer was placed on the bottom of the fuselage and a tricycle landing gear was installed in an effort to improve the take-off. It was also Alex's first five-channel ship. The plane was heavier than the Cub and much faster in the air, but not very maneuverable. Take-off runs were long, the plane couldn't get out of grass and the nose wheel was wiped out on almost every landing. Alex chalked it up as a complete loss and went back to Cubs.

The second Cub, built in the fall of 1951, was the first to have a five-channel control system giving independent right, left, up, down and engine control. The construction was altered to bring the landing gear back, following the trend established with the first Cub. To reduce frontal area, the wing was lowered by reducing the cabin height. Wing and stab on this ship were in line and about 1-1/2 in. above the thrustline. The take-off characteristics of the plane were good, but in the air it was a disappointment. The ship would drop the inside wing sharply in a turn, and once into a turn, opposite rudder had to be used to get it out. Even with the added elevator control it was a poor stunter. Loops were big, with a tendency to fall off to the side and turns had to be slow and wide to prevent spiral dives.

In the spring of 1952 the third, and what turned out to be the last, Cub design was built. The wing was raised again to a point about half-way between the extremes of the first two Cubs. At the same time the stab was lowered a little and this combination cured the spiraling tendency. Nose and tail moment arms were shortened a little to tighten up the maneuvers and the landing gear was moved back to its final position. The wing was patterned after Walt Good's Rudderbug wing

with washed out tips and an NACA 6412 airfoil. Total dihedral angle in the wing was 12°. Total weight was 9 lb.; wing loading, 19 oz. per sq. ft.

This plane was completed a few months before the 1952 Nats and right from the first it showed real promise, the result of Alex's two and a half years' of work and experience. Take-offs are easy and quick, the tail lifts in about 10 ft. and a touch of "up" puts the plane right in the air. Size and weight have permitted this plane to fly normally and safely in winds that have brought many contests to a dead stop. Maneuvers are tight and precise and very realistic. The plane is so stable that Alex had alternately to pulse down and right or left rudder to hold it in the three-turn spiral dive called for by the rules. Ground control on both take-off and landing are excellent. Common practice is to start the engine and leave the plane sitting by itself on low engine while Alex checks the controls; then, a punch at the engine button on the control box puts the engine on high speed and the plane is off. Landings are often made on low engine and the plane is taxied back to the transmitter.

During this period, Alex tried another wing on the ship. This wing had a slightly increased chord and a thick, undercambered airfoil. Although this wing was poor from the standpoint of contest performance, it made a perfect sport flier of the plane. Slow and stable and almost impossible to get into trouble with, it makes a good trainer for newcomers to radio control.

Two weeks before the 1952 Nats, Alex had the wing on his ship pull off in a high speed spiral dive. The fuselage was completely demolished and the post mortem showed that the 1/4 in. dowels used for the wing rubber bands had broken. With some hard, fast work, a new fuselage with 3/8 in. dowels was completed in time for the Nats. Spiral dives and power dives are done on low engine now, instead of high.

After the 1952 Nats, Alex worked on lightening the control equipment and no changes were made in the design of the plane. The plane flown at the 1954 Nats was essentially the same as the 1952 model, but a little lighter. The over-all weight of the present model is 8 lb.; wing loading, 18 oz. per sq. ft. The 6412 airfoil used has been thinned out a little to increase airspeed. The flying characteristics are similar to the 1952 model, but maneuvers are quicker and cleaner.

A scaled down, 6 ft. span version of the Cub was built in 1953. This ship out-performs the larger version, but fuel feed problems prevented its use at the 1954 Nats. Originally powered by an Orwick .29, it is now being equipped with a Fox .35 with two-speed ignition. Experiments, primarily with the wing design, will be conducted with this plane in an effort to improve flight characteristics during inverted flight and outside loops without sacrificing normal flight performance. This 6 ft. version is what Alex will probably fly at the 1955 Nationals.

Concurrently with the development of the airplane itself, work was done on the engines and control equipment installations used. The two-speed ignition system was the first to receive attention. Ignition rather than glow was decided on for several reasons. The Anderson Spitfire (which has been used in all of the planes except the 6 ft. version) uses so much fuel on glow plug that the weight and expense involved are actually greater than that represented by coil, batteries and fuel required for ignition operation. Two-speed operation is another problem. Although several good two-speed systems have been developed for glow engines, they seldom can be made to operate satisfactorily on the larger engines, Add to all that the trouble and expense of fuelproofing a ship of this

Proudly We Announce the 1956 super *JOHNSON Engines

Packed with Power & Ready to Prove It!

Guaranteed 1 Year

*Formerly the Orwick Engines, but just recently Purchased and Redesigned by Hi Johnson, the well known Model Designer.

See Your Dealer

4 Great Engines

.29 Cu. In. Disp. • Beam or Radial Mount • $14.95
.32 Cu. In. Disp. • Beam or Radial Mount • $15.49
.35 Cu. In. Disp. • Beam or Radial Mount • $15.95
.64 Cu. In. Disp. • Beam or Radial Mount • $27.50

MANUFACTURED BY Dynamic Models

1412 Del Mar Lane • Anaheim • Calif.

Still the OUTSTANDING HANDBOOK on

MODEL FLYING!

NOW in its 4th printing, this widely acclaimed work by the pioneer aero modeler of our age, CHARLES H. GRANT, has taught thousands upon thousands of beginners and advanced students in schools, clubs, and air force personnel on the basic fundamentals of all flight—models and large planes. . . That is why this big volume is acknowledged the "bible" among aero modelers and aviation students over the world.

THE BOOK THAT ANSWERS A THOUSAND FLIGHT QUESTIONS

—What is the best wing section to use?
—How is lift generated and calculated?
—How big should a model plane be; how much power should it have?
—At what angle should the stabilizer be set?
—What pitch is required for a given flying speed?
—How can a plane be made laterally stable?
—How to prevent spiral dives?
—What size propeller should be used? ETC. . . . ETC.

Get your copy of this complete course at only $3.75 postpaid. If you don't agree this is the finest course on model aviation and is just what you need, return within 10 days and money will be refunded in full!

AIR AGE, INC. • 551 FIFTH AVE. • New York 17

ADVT. INDEX, JULY 1955

Ace Products	44
A-J Aircraft Company	4th Cover
American Telasco	33
America's Hobby Center	4, 5
Austin Craft	40
Babcock Radio Engineering	32
Berkeley Models	55, 56
Bonner Specialties	48
C. G. Electronics	46
Canadian Model Supplies	44
Carter Craft Models	44
Comet Model Hobby Craft	43
L. M. Cox Mfg. Co.	40
Crafts & Hobbies	38, 48
Craftsmen Mfg. Company	48
DeBolt Model Engineering	8
Deltron Company	47
Ectron Products	43
Electronic Specialty Supply	46
Elwell Glue Co.	38
Eureka Importing Co.	45
Forster Brothers	44
Fox Mfg. Co.	35
Francisco Laboratories	1
Great Lakes Battery	50
Gull Model Airplane Co.	49, 51
Paul K. Guillow	35
Hawk Model Co.	49
Henry Engineering	47
Herkimer Tool & Model Works	3
Hobby Center	50
Hobby Enterprises	38
K & B Allyn Co.	3rd Cover
Koding Specialty Co.	41
Kenhi Model Products	51
MC Mfg. & Sales	54
McCoy Products Co.	33
Minnesota Engine Works	42
Model Aircraft Co.	44
Model Covering Co.	50
Model Trains	38
Moen Trading Co.	6
Monogram Models	37, 39
Newx Products	48
Pactra Chemical Co.	2nd Cover
Radiomodels	6
Spitfire Products	31
Sterling Models	45
Testor Chemical Co.	28, 29
Top Flite Models	41
Wilshire Model Center	36
World Engines	34

size and the ignition system becomes by far the simplest.

The problem then was to get a two-speed timer for the Spitfire. The solution was to machine out the inside of an Atwood two-speed timer so that it would fit. Once the timer was found, a means of switching from one point to the other had to be worked out. The first arrangement was to run the ignition circuit through the relay on the receiver. With signal on, the engine was on high for take-off; with signal off, it was on low. This system wasn't too satisfactory since there was no means of killing the engine and the signal had to be on to keep the engine on high speed. Ed Rockwood supplied the next system, an engine control servo that, when triggered by a short signal, would alternately seek one of two positions and operate switches to change the engine speed. The ignition circuit was also run through the back contact on the engine control relay. In that way the engine could be cut by holding a steady signal, while a short signal would change speed. This system was used for some time, but when lighter relays, unable to carry the ignition current, were installed in the receiver, a new method was needed. The present arrangement uses an escapement energized by the engine control relay; the de-energized positions of the escapement operate switches to give high or low speed and the energized positions open the ignition circuit. When a reliable escapement is used, this system is very dependable.

Good two-speed engine operation involves more than just a change of timer points, however. For maximum effectiveness there must be as wide a range as possible between high and low speed, and in this case it must be accomplished without changing the needle valve setting. The actual spread in timing is accomplished on the timers used by bending the cam rider to vary the relative time at which the points open. Since good low speed requires a richer mixture than does high, the needle valve is adjusted so that the engine just reaches a good two-cycling point on high speed. A gravity feed tank then helps to supply sufficient fuel for low speed. Since the engine operation must be steady during inverted as well as upright flight, and during the full length of the flight, the tank is deep, fairly large and centered about the needle valve. This supplies equal pressure upright and inverted and relatively small fuel level change during the five or ten minutes in the air. A "clank" tank is used, with two vents in the top. One vent is plugged during flight to prevent loss of fuel when inverted.

All of the radio equipment used has been the multi-channel, resonant reed type. The first three-channel receiver was purchased from Ed Rockwood. Later receivers were home built, with Ed's help and advice in many cases. Radio reliability is of prime importance in RC work and that reliability can only be achieved by complete familiarity with the equipment used, careful attention to the details of construction and operation and adequate power supplies. The battery complement carried by the plane consists of two large flashlight batteries for the filaments, an RCA VSO55 (or Eveready 455) for B supply and 10 pencells for ignition and servos. The A and B batteries are soldered into the circuit and used for several weeks before being replaced. Charging has been very effective in prolonging the life of the batteries, particularly the B supply.

We believe that the success of the Cub design has proven the reliability and effectiveness of resonant reed equipment and the soundness of the original postulate: that RC models should look and fly like real airplanes.

END

NEW

MC MODEL 350

HAND HELD TWO-TUBE MOPA

$24.95 Wired and Tested

$19.95 Complete Kit

$35.95 Special Combination

MC Model 350 transmitter and MC Model 20-250 Power Supply.

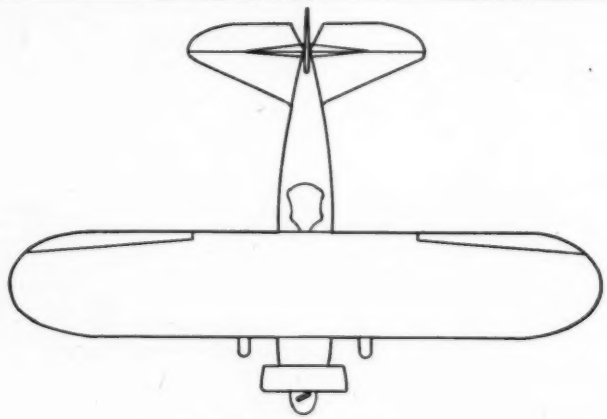
- 4-watts input when used with MC Model 20-250 Power Supply, which fits inside cabinet.
- Batteries may also be used for power.
- Attractively finished green Hammertone, steel cabinet, 8½" x 5½" x 3". Designed for ease of operation and handling.
- Antenna 54" long, collapses to 28" and is removable.
- Kit includes punched chassis and cabinet, formed coils, all parts, wire, hardware, and instructions.

Ask your dealer for MC products or write:

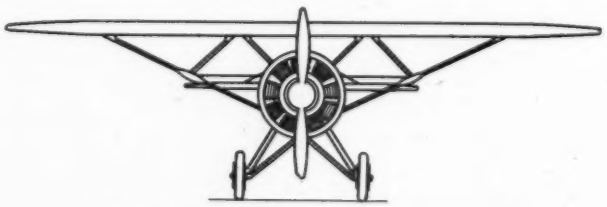
MC MANUFACTURING AND SALES CO.

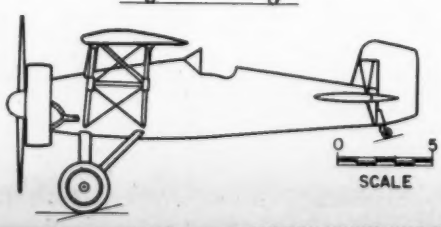
6720 Monroe Kansas City 30, Mo.

Illustrated folder upon request

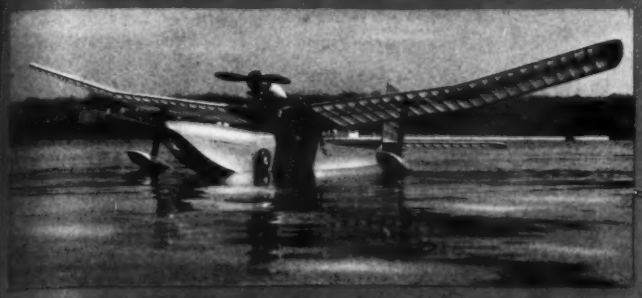


BOEING 202



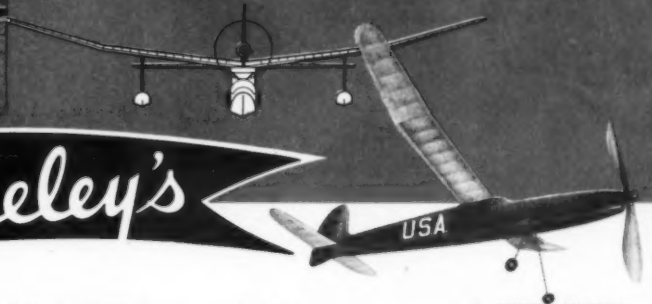


CONTEST FLYING TIME IS HERE!



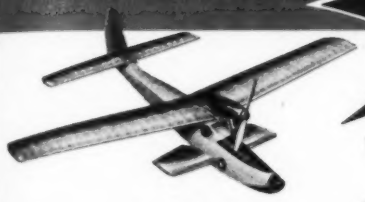
1 "CUSTOM PRIVATEER"

It's time to get ready for those big contests coming! Build now, test fly and trim your model to perfection. Berkeley designs give every model builder a chance to be the winner. Try one this season, and fly the best.



8 "SUPER CLOUD"

Berkeley's

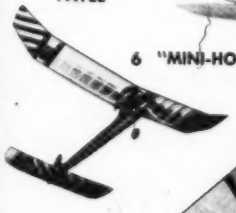


2 ½A "PRIVATEER"

3 "SEA-CAT"

4 AMAZON "400"

5 "PAYEE"



6 "MINI-HOGAN 34"

7 "SANDY HOGAN"

1 **"CUSTOM PRIVATEER"** R.C. Amphibian **$19.95**
For .45 to 1.20 Engines — 114" Wingspan
Free-Flight or R.C. Long Planing Hull, Ring Cowl

2 **½A "PRIVATEER"** Free Flight Flying Boat **$2.95**
For .035 to .074 Engines — 36" Wingspan
N.A.C.A. Long Planing Hull will R.O.W. in 15'

3 **"SEA-CAT"** R.C. Amphibian Flying Boat **$7.95**
For .15 to .25 Engines — 68" Wingspan
Long Planing Hull. R.C., Free-Flight or PAA-Load

4 **AMAZON "400"** V.T.O. Free-Flight **$4.95**
For .14 to .24 Engines — 62" Wingspan
Tremendous climb and glide, contest proven

5 **"PAYEE"** America Class PAA-Load Design..... **$2.95**
For .049 to .074 Engines — 50" Wingspan
Designed by 1954 National Champ Woody Blanchard

6 **"MINI-HOGAN 34"** Contest Free Flight **$2.95**
For .035 to .074 Engines — 34" Wingspan
Easy to build, a threat at every contest.

7 **"SANDY HOGAN"** Contest-Free Flight **$6.95**
For .29 to .35 Engines — 70" Wingspan
Warp resistant structure, enviable contest record

8 **"SUPER CLOUD"** Wakefield Design **$3.95**
Rubber Powered — 51" Wingspan — 8.113 oz.
Milled Balsa Prop Blank, Folder Hardware etc.

9 **BOOTSTRAPS "A-RC"** R.C., Free-Flight, PAA-Load **$4.95**
.09 to .14 Engines — 54" Wingspan
Clip in prone engine mount and R.C. chassis

10 **"ROYAL RUDDER-BUG"** Radio Controlled **$6.95**
For .14 to .23 Engines — 62" Wingspan
Designed by Walt Good. Cabin doors for R.C. access

11 **"SUPER BUCCANEER"** Radio Control, Free-Flight **$12.95**
For .60 to 1.20 Engines — 90" Wingspan
5½ pounds, 8.3 sq. feet area. 200 Contest Wins

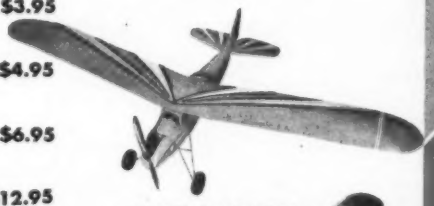
12 **½A "BOOTSTRAPS"** PAA-Load or Free-Flight **$2.50**
For .035 to .049 Engines — 40" Wingspan
Adaptable to America Class PAA-Load Rules

13 **CLOUD-COPTER "TR"** Helicopter **$3.50**
For .045 to .074 Engines — 25" Rotor Span
Adjustable Pitch operating Tail Rotor. Pre-fabricated!

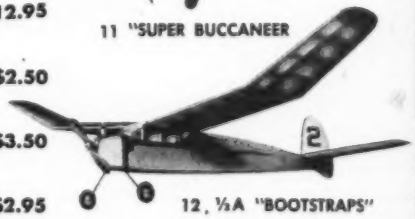
14 **CLOUD-COPTER "D-2"** Helicopter **$2.95**
For .045 to .074 Engines — 26" Rotor Span
Cyclo-Matic Control Fins — Highly Pre-fabricated!

9 BOOTSTRAPS "A-RC"

10 "ROYAL RUDDER-BUG"

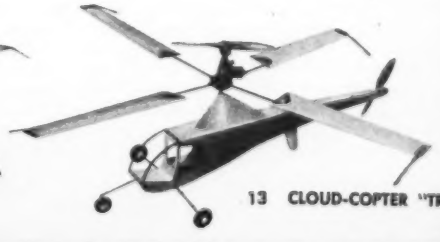


11 "SUPER BUCCANEER"



12, ½A "BOOTSTRAPS"

14 CLOUD-COPTER "D-2"



13 CLOUD-COPTER "TR"

buy **BERKELEY** at your local dealer!

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA., West Hempstead, N. Y. Please include 25¢ packing & postage.

Berkeley's R.C. FLYING SCALE

For Radio Control — Free-Flight — PAA-Load

"PIPER CUB J-3"

For .15 to .25 Engines—71" Span—2" Scale

Weight: 4½ lbs. — 700 Sq. In. Wing Area — 14.2 oz. Loading

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about. This is a rugged, detailed, flight proven design. Full-Size Plan with R.C. installations, Authentic Decals, etc.

$8.95

CESSNA "170"

For Radio Control — Free-Flight — PAA-Load

For .25 to .35 Engines — 72" Span — 2" Scale

Controlling your "Cessna 170" by Radio is a thrill you will not forget! Perfect in scale, rugged, stable in all attitudes, yet responsive in control, with good wind penetration qualities. The gear location is ideal for extended take-off runs. The larger than average size makes it easier to control in windy weather.

$10.95

Radio Control – Free-Flight – Controline

Piper "TRI-PACER" $5.95

This perfect scale R.C. design may be built as a Free-Flight or Controline version if desired. Full Size Plans cover special details for all three versions. Flaps, elevator, rudder, motor and nose gear may be operated by R.C. Ailerons for trim, cabin door access to Radio. Highly Pre-fabricated, Authentic Decals.

1⅛" = 1' Scale—44" Wingspan

.065 to .099 Engines—Radio Control

.035 to .075 Engines—Free-Flight

.075 to .15 Engines—Controline

$4.95

• Formed Metal Ring Cowl

De Havilland "BEAVER"

Radio Control – Free-Flight – Controline

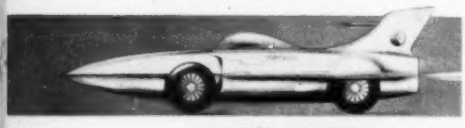
This high aspect-ratio Canadian Bush Flying type aircraft now is in use by the U.S. Air Force. As a scale design, it is well proportioned and capable of contest performance. In R.C. and Controline flying, its long moment arm make it ideal for spot landings with motor control. Metal Cowl, Full Size Plans, etc.

1" = 1' Scale 48" Wingspan

.049 to .075 Engines—Radio Control

.035 to .075 Engines—Free-Flight

.074 to .15 Engines—Controline



GENERAL MOTORS **"FIREBIRD"**

SCALE OPERATING PLASTIC CAR KIT

Supersonic Scale Speed with safe CO_2 Power

Assemble this scale turbojet experimental car in a matter of minutes. CO_2 capsule propells it at a super-sonic scale speed.

Complete Unit Including:

- Jet Starter Gun
- CO_2 Cartridges
- Plastic Cement

Car Kit **89c** Only **$1.49**

"FIBREGLAS*" COVERING CLOTH

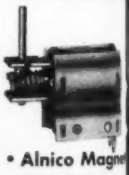
1 Sq. Yard — **$1.25**

"FYB-RES"

8 Oz. Resin and Hardener

$1.95

"Fyb-Res" applied to "Fibreglas*" cloth makes an armor-like incredibly strong finish for wood surfaces. As easy to use as tissue and dope, yet stronger than steel. Hot fuel proof!



"WONDER" ELECTRIC MOTORS

• Reliable • Powerful • Easy to Install

Far superior to any other electric motor. Available in Direct Drive, and in four ratios of reduction drive. Suitable for Boats, Cars, Radio Control Servos, Model Railroad Accessories, etc. Will run well on only one pencell (1½ volts) if desired.

• Alnico Magnet

3 to 6 Volt Operation

• Direct Drive	$1.49
• 10-1 Reduction	2.95
• 18-1 Reduction	2.95
• 100-1 Reduction	2.95
• 324-1 Reduction	2.95

27 mc. "SUPER AEROTROL" and Radio Control Accessories!

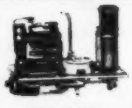
Combination "Super Aerotrol" TRANSMITTER-RECEIVER Kit (less tubes)	**$29.95**
"Super Aerotrol" 27mc. RECEIVER Kit (less tube)	**13.95**
"Super Aerotrol" Crystal Controlled 27mc. TRANSMITTER Kit (less tube)	**19.95**
Assembled, Ready-to-Operate "Super Aerotrol" 27mc. TRANSMITTER & RECEIVER	**49.95**
"Super Aerotrol" ESCAPEMENT — Self Neutralizing — Assembled Only	**3.95**
Super Sensitive Adjustable Contact RELAY — 5000 Ohms — Weight — 2 oz.	**7.50**
0-3 MILLIAMMETER — Manufactured for use with "Super Aerotrol" Receiver	**3.50**
0-50 MILLIAMMETER — Manufactured for use with "Super Aerotrol" Transmitter	**2.75**
XFG-1 TUBE — For Installation in "Super Aerotrol" 27mc. Receiver	**3.50**
3A5 TUBE — For Installation in "Super Aerotrol" 27mc. Transmitter	**2.25**
72 Page Book on "RADIO CONTROL for Model Aircraft and Boats"	**1.00**

NEW RADIO CONTROL BOOK

Kits may be assembled in less than two hours. No radio experience necessary. Step-by-step plans, color coded wiring. Just solder and screw together. Chassis and all electrical components are included.

ESCAPEMENT

MILLIAMMETER



RECEIVER Weighs 2¾ oz.

TRANSMITTER Crystal Controlled

buy **BERKELEY** at your local dealer!

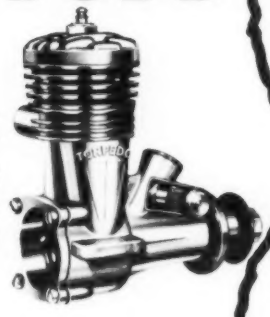
If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA, West Hempstead, N.Y. Please include 25¢ packing & postage

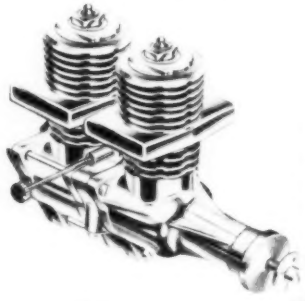
ONLY THE BEST IS TOPS

TORPEDO .15

$10.95

Power your new PAA-Load plane with the world's champion Torpedo .15. This is the engine that specifically qualifies for the new PAA-Load rules as outlined by PAA. It also qualifies for FAI rules and has won the World's Power Championship two years running—in England in 1953 and in New York in 1954. Surely it is tops!





SKY FURY TWIN

.099 - $9.95 .15 - $11.95

Here is the ultimate in twin engines at a price within reach of all. Both are built with the same rugged construction and mechanical fitness of the famous Sky Fury .049. The Sky Fury TWINS streamlines your plane, too, offering less frontal area than a single engine of comparable size.

Torpedo Engines
Also available in
.19 - $13.95 .23 - $13.95
.29 - $15.95
.35 - $14.95

Torpedo 2 Speed
.19 - $16.95
Also available in
.15 - $11.95

Mar Fury Twin
.12 - $10.95
Also available in Single
.049 - $5.95

Sky Fury Single
.049 - $4.95

Sea Fury Outboard Twin
.12 - $14.95 .15 - $16.95
Also available in Single
.049 - $9.95

Sea Fury Inboard Single
.049 - $9.95
Also available in Twin
.12 - $14.95
.15 - $16.95

SUPERSONIC
FUELS

	½ Pints	Pints
Supersonic "100"	$ .50	$ .80
Supersonic Ultra Glo	.55	.90
Supersonic "1000"	.60	1.00

Supersonic "100" only, also available in qts.—$1.45, ½ gals.—$2.75, gals.—$4.90

Allyn Craft
Scale Model Plastic Boat Kits
Outboard - $4.95
Also available in Inboard - $4.95

ACCESSORIES

- Streamline Wheels
- Slip On Connectors
- Glow Plugs
- Shur-Stops
- Fury Lube
- Radial Mounts
- Needle Valves
- Engine Mounts
- Spinners
- Fury Wrench

K&B Allyn **K&B ALLYN CO. • 5732 DUARTE ST. • LOS ANGELES 58, CALIF.**

No work to fly...

Jim Walker

FIREBABY

NOTHING TO BUILD

Just slip parts together, "gas up" and take-off!

EASY TO LEARN

Special "slow motion" prop permits learning to fly gradually without dizziness. Speed can be increased as you become skilled.

BUILT TO STAND PUNISHMENT

Here's a plane that "can take it" and keep right on flying! Flexible wing for rough weather flight. Motor mount, wing mount and rudder of aluminum aircraft alloy.

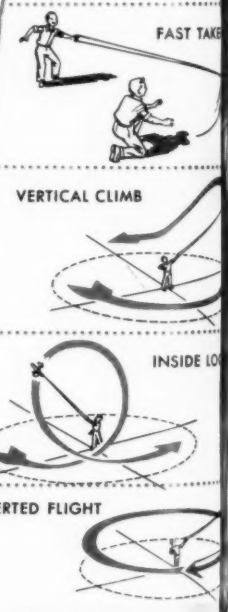
COMPLETE WITH LINES, CONTROLS, INSTRUCTIONS

U-Control handle, balloon tank, vinylite canopy, illustrated instructions for primary training and advanced stunt flying included in box. Span 19", wt. 3 oz. *Without engine,* **$2.50**

With Wasp .049 or Cub .049X engine	$7.85
With "Im Walker "Supercharged" engine	8.95
Firebaby "Biplane" stunt model without engine	3.50
Firebaby "Biplane" with Supercharged engine	9.75

★ AT YOUR NEAREST HOBBY COUNTER!

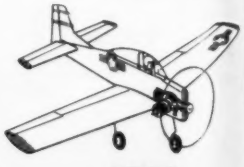
LOOK AT TH... fun
YOU CAN HA...



Jim Walker
A-J AIRCRAFT CO.
1166 N. E. 31st AVENUE
PORTLAND 12, OREGON

FIRECAT
Span 43". Stunt, Precision, Combat plane. Kit with all parts completely finished. No special tools needed

U-REELY CONTROL
Keeps flying lines off the ground and ready for instant use. Take off unassisted and reel in to land.



FIREBEE
With Remote Control Throt...
"Firecracker" engine and Mo...
Silencer Control. Kit includes